

AD-754 500

SHORT TAKE-OFF PLANES

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**AD-754 500**

# **SHORT TAKE-OFF PLANES**

## **A DDC BIBLIOGRAPHY**

**DDC-TAS-72-74**

**JANUARY 1973**

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# **SHORT TAKE-OFF PLANES**

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**JANUARY 1973**

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## F O R E W O R D

This bibliography consists of 150 unclassified and unlimited references pertaining to *Short Take-Off Planes*. These references were selected from entries processed into the Defense Documentation Center's data bank during the period of January 1960 through August 1972. Individual entries are arranged in AD number sequence under the heading AD Bibliographic References.

**BY ORDER OF THE DIRECTOR, DEFENSE SUPPLY AGENCY**

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**ROBERT B. STEGMAIER, JR.**  
Administrator  
Defense Documentation Center

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PERSONAL AUTHOR.....	P-1

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-257 571  
VEHICLE RESEARCH CORP PASADENA CALIF

DEVELOPMENT OF METHODS FOR PREDICTING V/STOL AIRCRAFT  
CHARACTERISTICS (U)

DEC 60 IV RETHORST, SCOTT ROYCE, W.W.:  
REPT. NO. 7  
CONTRACT: NONR309900

UNCLASSIFIED REPORT

DESCRIPTORS: \*HELICOPTERS, \*LOAD DISTRIBUTION, \*SHORT  
TAKE-OFF PLANES, \*VERTICAL TAKE-OFF PLANES, AERODYNAMIC  
CHARACTERISTICS, AERODYNAMIC CONFIGURATIONS, AIRFRAMES,  
AIRPLANES, CONVERTIBLE AIRPLANES, DESIGN, FLIGHT,  
MATHEMATICAL ANALYSIS, MATHEMATICAL PREDICTION,  
PROPELLERS (AERIAL), STABILITY, VARIABLE-PITCH  
PROPELLERS (U)

ANALYSES ARE DEVELOPED WHICH ENABLE PREDICTION OF  
THE PERFORMANCE CHARACTERISTICS OF A GENERALIZED  
SPECTRUM OF V/STOL AIRCRAFT. THE ANALYSES ALSO  
DEFINE OPTIMUM CONFIGURATIONAL FEATURES WITHIN THIS  
BROAD SPECTRUM. A RESOLUTION TO THE CONFLICT  
BETWEEN THE HOVERING AND FORWARD FLIGHT REGIMES IS  
PROVIDED BY THE ANALYSIS. BOTH AERODYNAMIC AND  
STRUCTURAL WEIGHT ASPECTS ARE INVESTIGATED. THESE  
TWO BASIC FACTORS ARE ANALYZED SEPARATELY, AND THEN  
COMBINED TO PROVIDE AN INTEGRATED ANALYSIS AS A BASIS  
FOR QUANTITATIVE PERFORMANCE PREDICTION. THE  
ANALYSIS DEFINES QUANTITATIVELY THE PERFORMANCE  
POTENTIAL OF ANY VTOL VEHICLE AS A FUNCTION OF ITS  
GEOMETRY, OPERATING CONDITIONS, AND WEIGHT. THIS  
UNIQUE POTENTIAL IS CHARTED TO ILLUSTRATE THE VARIOUS  
TRADE-OFFS IN PERFORMANCE CHARACTERISTICS AVAILABLE  
TO THE OPERATOR. (AUTHOR) (U)

UNCLASSIFIED

/ZOM08



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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOR

AD-257 800

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION WASHINGTON D  
C

A FLIGHT EXAMINATION OF OPERATING PROBLEMS OF V/STOL  
AIRCRAFT IN STOL-TYPE LANDING AND APPROACH (U)

JUN 61 1V INNIS, ROBERT C. QUIGLEY, HERVEY C.  
REPT. NO. TN D 862

UNCLASSIFIED REPORT

DESCRIPTORS: •AERODYNAMIC CHARACTERISTICS, •CONTROL  
SYSTEMS, •SHORT TAKE-OFF PLANES, •TRANSPORT PLANES,  
•VERTICAL TAKE-OFF PLANES, AIRPLANE LANDINGS, CONTROL,  
DRAG, FLIGHT TESTING, LIFT, PITCH (MOTION), ROLL,  
STABILITY, STALLING (U)

THE OPERATING ENVELOPE OF A LARGE TWIN-ENGINE  
STOL AIRCRAFT HAS BEEN EXAMINED AND GENERAL  
LIMITATIONS HAVE BEEN POINTED OUT WHICH THE PILOT  
MUST CONSIDER WHEN CHOOSING A MINIMUM LANDING  
APPROACH SPEED FOR STOL AIRCRAFT. THE  
SIGNIFICANCE OF SATISFACTORY STABILITY AND CONTROL  
CHARACTERISTICS IN THIS REGARD IS DISCUSSED. THE  
PROBLEMS REVIEWED IN THE REPORT WOULD ALSO BE  
REPRESENTATIVE OF THOSE OF A LARGE, OVER-LOADED VTOI  
AIRCRAFT OPERATING IN AN STOL MANNER.  
(AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-257 882

WICHITA STATE UNIV KANS

ACHIEVING CONSISTENCY IN MAXIMUM PERFORMANCE STOL  
LANDINGS

(U)

JAN 61 IV CRAIG, A. J. I  
REPT. NO. ER 351  
CONTRACT: DA44 177TC354  
MONITOR: TRECOM TR-61-41

UNCLASSIFIED REPORT

DESCRIPTORS: \*AERODYNAMIC CHARACTERISTICS, \*AIRPLANE  
LANDINGS, \*SHORT TAKE-OFF PLANES, \*TRANSPORT PLANES,  
AIRPLANES, FLIGHT PATHS, FLIGHT TESTING,  
INSTRUMENTATION, LANDING FIELDS, LANDINGS,  
MANEUVERABILITY, PILOTS, TEST METHODS, TESTS  
IDENTIFIERS: U-1 AIRCRAFT

(U)

(U)

FACTORS INFLUENCING THE ACHIEVEMENT OF MINIMUM  
DISTANCE LANDINGS OVER A BARRIER WERE INVESTIGATED TO  
DETERMINE WHAT MIGHT BE DONE TO PROVIDE CONSISTENCY  
IN LANDING IN A COMPUTED MINIMUM DISTANCE. IT WAS  
FOUND THAT THE PILOT REGULARLY EXTRACTED THE MAXIMUM  
AERODYNAMIC PERFORMANCE OF THE AIRPLANE, BUT THAT  
LIMITATIONS ACCOMPANYING MAXIMUM AERODYNAMIC  
PERFORMANCE PREVENTED CONSISTENTLY SHORT LANDINGS.  
THE PRIMARY LIMITATION WAS THE INABILITY TO FLATTEN  
OR STEEPEN THE DESCENT PATH DURING THE APPROACH TO  
THE BARRIER. (AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-258 268

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION WASHINGTON D  
C

STOL CHARACTERISTICS OF A PROPELLER-DRIVEN, ASPECT-  
RATIO-10, STRAIGHT-WING AIRPLANE WITH BOUNDARY-LAYER  
CONTROL FLAPS, AS ESTIMATED FROM LARGE-SCALE WIND-  
TUNNEL TESTS (U)

JUN 61 1V  
REPT. NO. TN D 1032

WEIBERG, JAMES A.; HOLZHAUSER, CURT A.;

UNCLASSIFIED REPORT

DESCRIPTORS: \*AERODYNAMIC CHARACTERISTICS, \*BOUNDARY  
LAYER CONTROL, \*FLAPS, \*LANDINGS, \*SHORT TAKE-OFF  
PLANES, \*TAKE-OFF, AIRPLANE MODELS, ASPECT RATIO,  
BOUNDARY LAYER CONTROL SYSTEMS, DUAL-ROTATION  
PROPELLERS, FLIGHT SPEEDS, LIFT, MODEL TESTS, PITCH  
(MOTION), ROLL, STABILITY, TESTS, TRANSPORT PLANES, WIND  
TUNNEL MODELS (U)

RESEARCH PRESENTED RELATIVE TO THE TAKE-OFF AND  
LANDING DISTANCES POSSIBLE WITH A CONVENTIONAL  
PROPELLER-DRIVEN TRANSPORT-TYPE AIRPLANE INDICATED  
THAT IF HIGHLY EFFECTIVE FLAPS WERE USED IN  
COMBINATION WITH LARGE AMOUNTS OF POWER TO AUGMENT  
LIFT (STOL), THE LANDING AND TAKE-OFF DISTANCES  
WOULD BE LESS THAN HALF OF THE DISTANCES FOR  
CONVENTIONAL OPERATION. THE STUDY IS BASED ON THE  
WIND-TUNNEL TESTS OF A MODEL WITH BLC ON THE  
TRAILING-EDGE FLAPS AND CONTROL SURFACES. AT THE  
LOWEST SPEEDS CONSIDERED (ABOUT 50 KNOTS),  
ADEQUATE LONGITUDINAL STABILITY WAS OBTAINED BUT THE  
LATERAL AND DIRECTIONAL STABILITY WERE  
UNSATISFACTORY. AT THESE LOW SPEEDS THE  
CONVENTIONAL AERODYNAMIC CONTROL SURFACES MAY NOT BE  
ABLE TO COPE WITH THE FORCES AND MOMENTS PRODUCED BY  
SYMMETRIC AS WELL AS ASYMMETRIC ENGINE POWER.  
THIS PROBLEM WAS ALLEVIATED BY INCREASING CONTROL  
EFFECTIVENESS BY USE OF BLC. FURTHER REDUCTIONS IN  
THE LANDING AND TAKE-OFF SPEEDS TO OBTAIN SHORTER  
DISTANCES PROBABLY WILL RESULT IN THE NEED TO  
SUPPLEMENT THE AERODYNAMIC CONTROLS, THE NEED FOR  
COUNTERROTATING PROPELLERS, AND POSSIBLY THE NEED FOR  
INTERCONNECTED SHAFTING ON THE PROPELLERS.  
(AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-263 450

GENERAL ELECTRIC CO CINCINNATI OHIO

RESULTS OF WIND TUNNEL TESTS OF A FULL SCALE FUSELAGE  
MOUNTED, TIP TURBINE DRIVEN LIFT FAN, VOLUME 2.  
ADDITIONAL 30 HOURS OF WIND TUNNEL TESTS, SEPTEMBER-  
DECEMBER 1960 (U)

APR 61 1V

CONTRACT: DA44 177TC584

MONITOR: TRECOM

TR-61-15-VOL-2

UNCLASSIFIED REPORT

DESCRIPTORS: \*SHORT TAKE-OFF PLANES, \*SHROUDED  
PROPELLERS, \*WIND TUNNELS, ACCELERATION, AERODYNAMIC  
CHARACTERISTICS, DECELERATION, DRAG, INSTRUMENTATION,  
LIFT, MEASUREMENT, MODEL TESTS, MOMENTS, PITCH  
(MATERIAL), PITCH (MOTION), STABILITY, TAILS (AIRCRAFT),  
TEST EQUIPMENT, TEST FACILITIES, TEST METHODS, TORQUE,  
WIND TUNNEL MODELS (U)

ANALYSES OF THE RESULTS ARE PRESENTED IN  
CONSIDERABLE DEPTH DEFINING FAN HOVER PERFORMANCE AND  
VARIATION WITH FLIGHT SPEED, COMPARING FAN POWERED  
WITH BASIC AIRCRAFT PERFORMANCE AND CALCULATING  
VARIOUS TRANSITION PERFORMANCE CHARACTERISTICS AND  
CONFIGURATION REQUIREMENTS FOR CASES OF MAXIMUM  
ACCELERATION, MAXIMUM CLIMB, CONTROLLED DESCENT,  
UNACCELERATED LEVEL FLIGHT AND SHORT TAKE OFF  
(WITH AND WITHOUT OVERLOADS). (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-263 597

CORNELL AERONAUTICAL LAB INC BUFFALO N Y

THE INFLUENCE OF TWO-DIMENSIONAL STREAM SHEAR ON  
AIRFOIL MAXIMUM LIFT (U)

AUG 61 1V VIDAL, R. J.; CURTIS, J. T.; HILTON, J. H. I  
REPT. NO. A1 1190 A 7  
CONTRACT: DA44 177TC439  
MONITOR: TRFCOM TR-61-93

UNCLASSIFIED REPORT

DESCRIPTORS: \*AIRFOILS, \*LIFT, \*SHORT TAKE-OFF PLANES,  
\*VERTICAL TAKE-OFF PLANES, AERODYNAMIC CHARACTERISTICS,  
EXPERIMENTAL DATA, FLIGHT SPEEDS, GAS FLOW, JETS,  
LANDINGS, MATHEMATICAL ANALYSIS, MODEL TESTS,  
PERTURBATION THEORY, PRESSURE, TAKE-OFF, WINGS (U)

THE EFFECTS OF STREAM VELOCITY GRADIENT ON AIRFOIL  
MAXIMUM LIFT ARE DEFINED WITH EXPERIMENTAL DATA OBTAINED  
IN A SIMULATED TWO-DIMENSIONAL SLIPSTREAM. THE EXPERIMENTAL  
RESULTS SHOW THAT WHEN POSITIONED NEAR THE SLIPSTREAM PLANE  
OF SYMMETRY, THE AIRFOIL MAXIMUM LIFT VARIES MARKEDLY WITH  
LOCATION IN THE SLIPSTREAM. IN MOVING THE AIRFOIL FROM ABOVE  
TO BELOW THE SLIPSTREAM PLANE OF SYMMETRY THROUGH A TOTAL  
DISTANCE CORRESPONDING TO THE AIRFOIL THICKNESS, FORCE DATA  
AND BOUNDARY-LAYER OBSERVATIONS SHOW THAT BOUNDARY-LAYER  
SEPARATION IS DELAYED TO HIGHER ANGLE OF ATTACK AND THE  
AIRFOIL MAXIMUM LIFT IS DOUBLED. IT IS CONCLUDED THAT THE  
DESTALLING EFFECT OBSERVED IN THE NONUNIFORM SLIPSTREAM IS  
ASSOCIATED WITH SLIPSTREAM BOUNDARY INTERFERENCE BUT  
STEMS FROM THE INFLUENCE OF A LARGE LOCAL SLIPSTREAM  
SHEAR ON AIRFOIL CHARACTERISTICS. THE EFFECTS OF UNIFORM  
AND NONUNIFORM SHEAR ON AIRFOIL LIFT AND PRESSURE  
DISTRIBUTION ARE DISCUSSED, WITHIN THE FRAMEWORK OF  
EXISTING FIRST-ORDER, SMALL-SHEAR THEORY, TO SHOW THAT  
THESE EFFECTS OF SHEAR TEND TO PROMOTE STALL. A  
POHLHAUSEN CALCULATION OF THE LAMINARY BOUNDARY LAYER  
IN A STREAM WITH SHEAR IS USED TO IDENTIFY AND ASSESS  
THE EFFECTS OF STREAM SHEAR ON BOUNDARY-LAYER  
SEPARATION CRITERIA. (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOR

AD-266 771

FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

GAS TURBINE ENGINES IN SHORT OR VERTICAL TAKE-OFF AND  
LANDING AIRCRAFT (U)

DEC 61 14 WATTKY, D. J  
REPT. NO. MCL 1392

UNCLASSIFIED REPORT

DESCRIPTORS: \*GAS TURBINES, AIRPLANE ENGINES, DATA, JET  
ENGINES, JET PROPULSION, SHORT TAKE-OFF PLANES,  
TRANSLATIONS, TURBOFAN ENGINES, VERTICAL TAKE-OFF  
PLANES (U)

IDENTIFIERS: GERMANY (U)

A REVIEW IS GIVEN OF THE EMPLOYMENT POSSIBILITIES  
OF GAS TURBINE POWER PLANTS IN STOL-, VTOC- AND  
VTOL-AIRCRAFT. THE DEVELOPMENT OF NEW GAS  
TURBINE ENGINES FOR VTOL-AIRCRAFT WAS GENERALLY  
DISCONTINUED WHILE CONVENTIONAL GAS TURBINES ARE MADE  
SERVICEABLE FOR SPECIAL VTOL PURPOSES OF TAKE OFF,  
E.G. BY TRAVERSING THE ENGINE, DEFLECTION OF GAS JET;  
THRUST NOZZLE ROTATION, AND JACKETED FANS. A  
PRIME REQUIREMENT EXISTS FOR LOW ENGINE MASS/THRUST  
RATIO EXEMPLIFIED BY THE LIGHT WEIGHT JET TURBINE  
RB.108 OF THE ROLLSROYCE LTD. MENTION IS  
MADE OF THE SPECIAL VTOL GAS TURBINE BY BRISTOL-  
SIDDELEY ENGINES LTD. WHICH IS PROVIDED WITH A  
TURBOFAN, THE TYPE DESIGNATION OF WHICH IS STILL  
UNKNOWN. DATA PERTAINING TO GAS TURBINE ENGINES  
USED IN VTOL AIRCRAFT ARE TABULATED. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-267 523

WICHITA STATE UNIV KANS SCHOOL OF ENGINEERING

A SUMMARY ANALYSIS OF AN STOL TRANSPORT (U)

AUG 61 IV RAZAK, KENNETH; CRAIG, A. J. I

UNCLASSIFIED REPORT

DESCRIPTORS: AERODYNAMIC CHARACTERISTICS, AERODYNAMIC CONFIGURATIONS, ANALYSIS, DEFLECTION, DESIGN, DOWNWASH, DRAG, FLAPS, JET FLAPS, JETS, LIFT, MATHEMATICAL ANALYSIS, MILITARY REQUIREMENTS, MODEL TESTS, MOMENTS, SHORT TAKE-OFF PLANES, THEORY, TOPOLOGY, TRANSPORT PLANES, WIND TUNNEL MODELS, WINGS (U)

THIS REPT. INCLUDES: THE TOPOLOGY OF THE AERODYNAMIC PARAMETERS OF AN AIRPLANE WITH A JET-AUGMENTED FLAP, BY WILLIAM H. WENTZ, JR.

THESIS, JUNE 61, 58P. INCL. ILLUS. A

PRELIMINARY ANALYSIS HAS BEEN MADE OF AN STOL TRANSPORT OF 35,000 POUNDS GROSS WEIGHT EQUIPPED WITH FEATURES THAT PRODUCE A TOTAL PERFORMANCE NOT HERETOFORE ACHIEVED IN A SINGLE AIRPLANE. THE PRIME GOAL OF THE ANALYSIS WAS TO SECURE AN AIRPLANE IN WHICH A PILOT COULD CONSISTENTLY ACHIEVE LANDINGS SUCH THAT THE LANDING FIELD LENGTH IS THE SAME AS THE BEST PERFORMANCE OF THE AIRPLANE. THE LANDING DISTANCE OF THIS AIRPLANE IS 1170 FEET AND THE TAKE-OFF DISTANCE IS 1380 FEET, BOTH OVER A 50-FOOT OBSTACLE AT ICAO STANDARD SEA LEVEL CONDITIONS. A METHOD OF ANALYSIS IS DESCRIBED WHICH INVOLVES THE USE OF TRAILING EDGE FLAPS DEFLECTED TO 100 DEGREE AND THE USE OF THRUST TO FLARE THE AIRPLANE. THE CONTROL OF THE AIRPLANE L/D RATIO MAKES IT POSSIBLE TO ACHIEVE CONSISTENTLY THE ABOVE LANDING DISTANCES. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-269 082

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION WASHINGTON D  
C

TABLES OF INTERFERENCE FACTORS FOR USE IN WIND-TUNNEL  
AND GROUND-EFFECT CALCULATIONS FOR VTOL-STOL  
AIRCRAFT. PART I - WIND TUNNELS HAVING WIDTH-HEIGHT  
RATIO OF 2.0 (U)

JAN 62 1V HEYSON, HARRY H. I  
REPT. NO. TN D 933

UNCLASSIFIED REPORT

DESCRIPTORS: \*SHORT TAKE-OFF PLANES, \*VERTICAL TAKE-OFF  
PLANES, \*WIND TUNNELS, AERODYNAMIC CHARACTERISTICS,  
CONFIGURATION, GROUND EFFECT, INTERFERENCE, MATHEMATICAL  
ANALYSIS, TABLES, WIND TUNNEL MODELS (U)

TABLES OF INTERFERENCE FACTORS FOR USE IN WIND-  
TUNNEL AND GROUND-EFFECT CALCULATIONS FOR VTOL-STOL  
AIRCRAFT ARE PRESENTED FOR WIND TUNNELS HAVING A  
WIDTH-HEIGHT RATIO OF 2.0. THESE TABLES WERE  
MACHINE-CALCULATED AND ARE INTENDED FOR USE WITH THE  
PROCEDURES OF NASA TECHNICAL REPORT R-124.  
THESE TABLES ARE PRESENTED WITHOUT COMMENT.  
(AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM96

AD-269 091

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION WASHINGTON D  
C

TABLES OF INTERFERENCE FACTORS FOR USE IN WIND-TUNNEL  
AND GROUND-EFFECT CALCULATIONS FOR VTOL-STOL  
AIRCRAFT. PART II - WIND TUNNELS HAVING WIDTH-HEIGHT  
RATIO OF 1.5 (U)

JAN 62 1V HEYSON, HARRY H. I  
REPT. NO. TN D 934

UNCLASSIFIED REPORT

DESCRIPTORS: \*SHORT TAKE-OFF PLANES, \*VERTICAL TAKE-OFF  
PLANES, \*WIND TUNNELS, AERODYNAMIC CHARACTERISTICS,  
CONFIGURATION, GROUND EFFECT, INTERFERENCE, MATHEMATICAL  
ANALYSIS, TABLES, WIND TUNNEL MODELS (U)

DESCRIPTORS: (DOPPLER TRACKING, ATELITE  
VEHICLES, MATHEMATICAL ANALYSIS, ANALYTIC  
GEOMETRY, EQUATIONS, MATRIX ALGEBRA.)  
(\*STELLE VEHICLE TRAJECTORIES, MATHEMATICAL  
ANALYSIS, STATISTICAL ANALYSIS, LEAST SQUARES  
METHOD.) (ERROR, PROPAGATION, ANALYSIS OF  
VARIANCE, DETERMINANTS.) IDENTIFIER:  
POLYDOP. THE MATHEMATICS FOR POLYDOP IS  
PRESENTED. THE DEVELOPMENT STARTS WITH THE  
DERIVATION OF THE BASIC MATHEMATICAL RELATIONS. THE  
CONDITIONS NECESSARY FOR THE EXISTENCE OF A UNIQUE  
SOLUTION TO THESE EQUATIONS ARE DISCUSSED, AND THE  
SOLUTIONS TO A NUMBER OF POLYDOP SYSTEM EQUATIONS ARE  
PRESENTED. THE PROBLEMS THAT APPEAR WHEN MORE THAN  
ONE VEHICLE IS IN THE REGION OF OBSERVATION OF THE  
SYSTEM AT ANY GIVEN TIME ARE DISCUSSED. SITUATIONS  
ARE CONSIDERED IN WHICH THE SAME DATA MIGHT BE TAKEN  
EVEN IF THE VEHICLE PATHS CORRESPONDING TO THIS DATA ARE  
NOT THE SAME. THE PROBLEM OF CONVERSION OF RANGE  
INFORMATION INTO CARTESIAN COORDINATE INFORMATION IS  
TREATED. THE TWO MOST COMMON MEASURES OF ERROR  
PROPAGATION AND A METHOD FOR FINDING THE POINT OF  
INTERSECTION OF TWO CONICS ARE INCLUDED.  
AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-269 921

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION WASHINGTON D  
C

TABLES OF INTERFERENCE FACTORS FOR USE IN WIND-TUNNEL  
AND GROUND-EFFECT CALCULATIONS FOR VTOL-STOL  
AIRCRAFT, PART IV - WIND TUNNELS HAVING WIDTH-HEIGHT  
RATIO OF 0.5 (U)

JAN 62 1V HEYSON, HARRY H.:  
REPT. NO. TN D 936

UNCLASSIFIED REPORT

DESCRIPTORS: \*INTERFERENCE, \*TABLES, \*WIND TUNNELS,  
AERODYNAMIC CONFIGURATIONS, BOUNDARY LAYER,  
CONFIGURATION, DATA, JETS, LIFT, SHORT TAKE-OFF PLANES,  
VERTICAL TAKE-OFF PLANES, WIND TUNNEL MODELS (U)

TABLES OF INTERFERENCE FACTORS FOR USE IN  
WINDTUNNEL AND GROUND-EFFECT CALCULATIONS FOR  
VTOLSTOL AIRCRAFT ARE PRESENTED FOR WIND TUNNELS  
HAVING A WIDTH-HEIGHT RATIO OF 0.5. THESE TABLES W  
RE MACHINE-CALCULATED AND ARE INTENDED FOR USE WITH  
THE PROCEDURES OF NASA TECHNICAL REPORT R-124  
(AD-269 611). (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOR

AD-270 110  
PRINCETON UNIV N J

APPLICATION OF SMALL-SCALE PROPELLER TEST DATA TO V/  
STOL AIRCRAFT DESIGN (U)

OCT 61 IV PAYNE, HENRY E. III. I

UNCLASSIFIED REPORT

DESCRIPTORS: \*MODEL TESTS, \*PROPELLER BLADES, \*ROTOR  
BLADES (ROTARY WINGS), \*ROTOR BLADES (TURBOMACHINERY),  
\*SHORT TAKE-OFF PLANES, \*VERTICAL TAKE-OFF PLANES,  
AERODYNAMIC CONFIGURATIONS, LABORATORY EQUIPMENT,  
MATHEMATICAL PREDICTION, RELIABILITY, TEST EQUIPMENT,  
TEST METHODS, WIND TUNNEL MODELS, WIND TUNNELS (U)

A COMPILATION OF AVAILABLE EXPERIMENTAL AND  
ANALYTICAL DATA IS PRESENTED, DEALING WITH THE  
EFFECTS OF PROPELLERS (AND ROTORS) ON V/STOL  
TAKE-OFF AND TRANSITION FLIGHT. SINCE THE MAJORITY  
OF THE EXPERIMENTAL WORK WAS CONDUCTED WITH SMALL-  
SCALE PROPELLERS/ROTORS, CONSIDERABLE EFFORT WAS  
EXPENDED TO DEMONSTRATE THE APPLICABILITY OF THESE  
DATA TO FULL-SCALE PROPELLERS. THE DEPENDENCE OF  
TAKE-OFF PERFORMANCE ON BLADE REYNOLD'S NUMBER AND  
TIP MACH NUMBER IS DESCRIBED. RECENT RESULTS  
FROM THE NAVY FLYING WIND TUNNEL HAVE CONCLUSIVELY  
INDICATED THE DEPENDENCE OF MODEL V/STOL TRANSITION  
FLIGHT DATA ON THE CHARACTER OF THE MODEL TEST  
FACILITY. THEREFORE, THE CORRELATION OF MODEL VS.  
FULLSCALE PROPELLER/ROTOR TRANSITION DATA WAS  
IMPOSSIBLE BECAUSE OF THE NON-AVAILABILITY OF  
ACCURATE FULL-SCALE RESULTS. DATA ARE PRESENTED  
DESCRIBING IDENTICAL TESTS RUN ON THE AIRSHIP AND IN  
THREE DIFFERENT WIND TUNNELS. A BRIEF ANALYTICAL  
TREATMENT IS DESCRIBED WHICH MIGHT ENABLE MORE WORK  
TO PROCEED TO CORRECT FOR WALL INTERFERENCE. IN  
ADDITION, THE EXPERIMENTAL TECHNIQUES USED TO OBTAIN  
ACCURATE LOW VELOCITY MEASUREMENTS AND TO OBTAIN  
VIBRATION-FREE STRAINAGE TRACES ARE BRIEFLY  
DESCRIBED. (AUTHOR) (U)

UNCLASSIFIED

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-275 507

CENTER FOR NAVAL ANALYSES WASHINGTON D C OPERATIONS  
EVALUATION GROUP

STATUS OF V/STOL TECHNOLOGY

(U)

APR 62 IV MILLER, R.H. I  
REPT. NO. IRM15

UNCLASSIFIED REPORT

DESCRIPTORS: \*SHORT TAKE-OFF PLANES, \*TRANSPORT PLANES,  
\*VERTICAL TAKE-OFF PLANES, CARRIER LANDINGS, DESIGN,  
LOGISTICS, MILITARY REQUIREMENTS, NAVAL AIRCRAFT, NAVAL  
OPERATIONS, OPERATIONS RESEARCH (U)

THE MISSION AND CAPABILITIES OF A TILT-WING VTOL  
LOGISTIC TRANSPORT, AS REQUIRED BY THE NAVY, ARE  
DISCUSSED. THE DESIGN PARAMETERS NEEDED TO FULFILL  
THESE REQUIREMENTS AS WELL AS THE CURRENT STATE OF  
THE ART ARE PRESENTED. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-276 504

NORTH AMERICAN AVIATION INC LOS ANGELES CALIF

LOW SPEED FREE AIR TESTS OF A POWERED .165 SCALE FOUR  
ENGINE TILT WING V/STOL MODEL (U)

MAR 62 1V  
REPT. NO. NA62H 211

UNCLASSIFIED REPORT

DESCRIPTORS: \*CONVERTIBLE AIRPLANES, \*SHORT TAKE-OFF  
PLANES, \*VERTICAL TAKE-OFF PLANES, AERODYNAMIC  
CHARACTERISTICS, DRAG, LIFT, MODEL TESTS, MOMENTS,  
TABLES (U)

LOW SPEED FREE AIR TESTS OF A POWERED .165 SCALE FOUR  
ENGINE TILT WING V/STOL MODEL.

UNCLASSIFIED

/ZOM08

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-276 616

ADVISORY GROUP FOR AERONAUTICAL RESEARCH AND DEVELOPMENT  
PARIS (FRANCE)

FACTORS LIMITING THE LANDING APPROACH SPEED OF  
AIRPLANES FROM THE VIEWPOINT OF A PILOT

(U)

APR 61 12P INNIS, R.C.:  
REPT. NO. 358

UNCLASSIFIED REPORT

DESCRIPTORS: \*BOUNDARY LAYER CONTROL, \*JET FIGHTERS,  
\*SHORT TAKE-OFF PLANES, \*TRANSIENTS, AILERONS, AIRPLANE  
LANDINGS, CONTROL, FLAPS, FLIGHT TESTING, PROPELLERS  
(AERIAL), STABILITY, WAKE (U)

AN EXAMINATION WAS MADE FROM THE PILOT'S POINT OF  
VIEW OF SOME OF THE FACTORS LIMITING THE LANDING  
APPROACH SPEED OF AIRPLANES. THE RESULTS OF TWO  
SPECIFIC AIRCRAFT WERE CONSIDERED: ONE A SWEEPWING  
JET FIGHTER EMPLOYING BLOWING-TYPE BOUNDARY LAYER  
CONTROL (BLC) ON HIGHLY DEFLECTED LEADING AND  
TRAILING-EDGE FLAPS, AND THE OTHER A STRAIGHT-WING,  
TWIN-ENGINE CARGO AIRCRAFT USING PROPELLER SLIPSTREAM  
IN CONJUNCTION WITH AN AREA SUCTION BLC SYSTEM ON  
THE FLAPS AND DROOPED AILERONS TO DEVELOP HIGH LIFT.  
AN ATTEMPT IS MADE TO PROVIDE A BETTER  
UNDERSTANDING OF THE EFFECT OF VARIOUS STABILITY AND  
CONTROL CHARACTERISTICS ON THE PILOT'S SELECTION OF  
APPROACH SPEEDS. IT IS SHOWN THAT IN THE PRESENCE  
OF POOR HANDLING QUALITIES, THE PILOT DEMANDS AN  
EXCESS MARGIN OF SPEED WHICH HE USES TO COMPENSATE  
FOR THE ATTENTION REQUIRED BY THE UNDESIRABLE  
CHARACTERISTICS. (AUTHOR) (U)

UNCLASSIFIED

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UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDMOB

AD-283 081

BELL AEROSYSTEMS CO BUFFALO N Y

CONTROL CHARACTERISTICS OF V/STOL AIRCRAFT IN  
TRANSITION

(U)

JUL 62 223P  
REPT. NO. 2023 917002  
CONTRACT: NOW-61-0859

HENDERSON, C. I. KROLL, J. I. HESBY, A. I.

UNCLASSIFIED REPORT

DESCRIPTORS: \*FLIGHT SIMULATORS, \*SHORT TAKE-OFF PLANES,  
\*VERTICAL TAKE-OFF PLANES, ANALOG SYSTEMS, CONTROL  
SIMULATORS, CONTROL SYSTEMS, DAMPING, FLIGHT PATHS,  
FLIGHT SPEEDS, HOVERING, PITCH (MATERIAL), PITCH  
(MOTION), ROLL, YAW

(U)

IDENTIFIERS: HOVERING, VTOL CRAFT BELL D-  
2064, VTOL CRAFT BELL D-58K. A SIMULATOR STUDY  
WAS MADE OF THE LONGITUDINAL CONTROL AND FLIGHT  
HANDLING CHARACTERISTICS OF THREE TYPES OF V/STOL  
AIRCRAFT DURING THE TRANSITIONAL PHASE OF FLIGHT BET  
WEEN HOVE° AND CONVENTIONAL LEVEL FLIGHT. THE  
AIRCRAFT CONFIGURATIONS STUDIED WERE IN THE 35,000  
POUND WEIGHT CLASS AND OF THE FOLLOWING TYPES:  
(1) DUAL TANDEM DUCTE PROPELLER, (2) TILT  
ROTOR, AND (3) TILT WING WITH DEFLECTED  
SLIPSTREAM. FLIGHT EVALUATION OF CONTROL POWER AND  
DAMPING WERE CONDUCTED TO DETERMINE PILOT RATING  
BOUNDARIES FOR EACH CONFIGURATION. OTHER  
AERODYNAMIC AND CONTROL PARAMETERS INVESTIGATED WERE:  
(1) SPEED STABILITY PARAMETER, (2) STATIC  
STABILITY PARAMETER, (3) CHANGE IN PITCHING MOMENT  
DUE TO CHANGE IN THROTTLE, (4) CONVERSION RATE,  
(5) THROTTLE GRADIENT AND (6) SLOPE OF THE  
POWER REQUIRED CURVE. (AUTHOR)

(U)

UNCLASSIFIED

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UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-285 079

VEHICLE RESEARCH CORP PASADENA CALIF

DEVELOPMENT OF METHODS FOR PREDICTING V/STOL AIRCRAFT  
CHARACTERISTICS (U)

DEC 61 1V RETHORST, SCOTT; FUJITA, TOSHIO;  
REPT. NO. 12  
CONTRACT: NONR309900

UNCLASSIFIED REPORT

DESCRIPTORS: \*HELICOPTERS, \*SHORT TAKE-OFF PLANES,  
\*VERTICAL TAKE-OFF PLANES, AERODYNAMIC CONFIGURATIONS,  
AIR FORCE OPERATIONS, AIRFRAMES, COMPUTERS, CONVERTIBLE  
AIRPLANES, DESIGN, FLIGHT PATHS, JET PLANES, LOAD  
DISTRIBUTION, MATHEMATICAL ANALYSIS, MATHEMATICAL  
PREDICTION, MILITARY REQUIREMENTS, NOMOGRAPHS,  
OPERATIONS RESEARCH, TABLES (U)

DESCRIPTORS: \*VERTICAL TAKE-OFF PLANES,  
\*SHORT TAKE-OFF PLANES, \*HELICOPTERS, MATHE  
MATICAL ANALYSIS, MATHEMATICAL PREDICTION,  
CONVERTIBLE AIRPLANES, DESIGN, OPERATIONS RE  
SEARCH, AIR FORCE OPERATIONS, MILITARY RE  
QUIREMENTS, JET PLANES, FLIGHT PATHS, AERODY  
NAMIC CONFIGURATIONS, AIRFRAMES, LOAD DISTRI  
BUTION, COMPUTERS, NOMOGRAPHS, TABLES,  
AERODYNAMICS. THE ANALYSES OF THE PREVIOUS  
PHASE I (AD-244 736) AND PHASE II (AD-257  
571) STUDIES ARE EXTENDED AND REFINED. THE  
RELATIONSHIPS AMONG BASIC V/STOL PERFORMANCE  
PARAMETERS ARE BROUGHT INTO FOCUS. RESULTS ARE  
CAST INTO AN ENGINEERING FORM. A 'SLIDE-RULE' TYPE  
COMPUTER AND A SET OF NOMOGRAPHS ARE FURNISHED TO  
SIMPLIFY PREDICTION OF V/STOL AIRCRAFT  
CHARACTERISTICS. PROPELLERDRIVEN V/STOL AIRCRAFT  
ARE ANALYZED IN TERMS OF TRADE-OFFS AMONG BASIC  
PERFORMANCE PARAMETERS FOR A GENERALIZED MISSION  
PROFILE. THE ATTAINMENT OF HIGH PERFORMANCE  
POTENTIAL IS DEPENDENT ON THE BASIC AERODYNAMIC  
PARAMETERS GOVERNING THE FORWARD FLIGHT CAPABILITIES  
OF CONVENTIONAL AIRCRAFT. FOR V/STOL AIRCRAFT  
THE VARIABLE DISC AREA PARAMETER (RATIO OF HOVERING  
DISC AREA TO FORWARD FLIGHT DISC AREA) HAS A MARKED  
EFFECT ON PERFORMANCE POTENTIAL. THE 'SLIDE-RULE'  
AND NOMOGRAPHS ENCOMPASS A WIDE RANGE OF BASIC  
PARAMETERS INCLUDING VARIABLE DISC AREA AND ARE  
APPLICABLE TO PROP-DRIVEN V/STOL AIRCRAFT.

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-289 561  
PRINCETON UNIV N J

A PRELIMINARY STUDY OF THE DYNAMIC STABILITY AND  
CONTROL RESPONSE DESIRED FOR V/STOL AIRCRAFT (U)

JUN 62 1V ELLIS, D. R.; CARTER, G. A. I

UNCLASSIFIED REPORT

DESCRIPTIONS: \*SHORT TAKE-OFF PLANES, \*VERTICAL TAKE-OFF  
PLANES; ACCELERATION, AUTOMATIC, AUTOMATIC PILOTS,  
EQUATIONS, FEEDBACK; FLIGHT PATHS, FLIGHT SIMULATORS,  
GUSTS, HELICOPTERS, HOVERING, MATHEMATICAL ANALYSIS,  
MOTION, PITCH (MOTION), SIMULATION, STABILITY,  
STABILIZATION SYSTEMS, VELOCITY (U)

LONGITUDINAL DYNAMICS AND CONTROL RESPONSE DESIRED FOR  
VTOL/STOL AIRCRAFT STABILIZED AUTOMATICALLY.

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-401 106

BOEING CO MORTON PA VERTOL DIV

RESEARCH PROGRAM TO DETERMINE THE FEASIBILITY AND  
POTENTIAL OF THE GROUND EFFECT TAKE-OFF AND LANDING  
(GETOL) CONFIGURATION (U)

DEC 62 198P

WAHL, H. MCHUGH, F. I

REPT. NO. R 276

CONTRACT: DA44 177TC663

MONITOR: TRECOM

TR-62-63-VOL-2

UNCLASSIFIED REPORT

DESCRIPTORS: \*SHORT TAKE-OFF PLANES, AERODYNAMIC  
CHARACTERISTICS, AIRPLANE MODELS, ARMY AIRCRAFT, DUCTED  
FANS, FEASIBILITY STUDIES, GROUND EFFECT, MODEL  
TESTS (U)

WIND TUNNEL STUDIES TO EVALUATE THE FEASIBILITY AND  
POTENTIAL OF THE GROUND EFFECT TAKE-OFF AND LANDING (GETOL)  
CONFIGURATION.

UNCLASSIFIED

/ZOM08

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL No. /ZOM08

AD-401 149

BOEING CO MORTON PA VERTOL DIV

RESEARCH PROGRAM TO DETERMINE THE FEASIBILITY AND  
POTENTIAL OF THE GROUND EFFECT TAKE-OFF AND LANDING  
(GETOL) CONFIGURATION, VOLUME I (U)

DEC 62 1V

REPT. NO. R276

CONTRACT: DA44 177TC663

MONITOR: TRECOM TR-62-63-VOL-1

UNCLASSIFIED REPORT

DESCRIPTORS: \*SHORT TAKE-OFF PLANES, AERODYNAMIC  
CHARACTERISTICS, AIRPLANE MODELS, ARMY AIRCRAFT, DUCTED  
FANS, FEASIBILITY STUDIES, GROUND EFFECT, MODEL  
TESTS (U)

WIND TUNNEL STUDIES TO EVALUATE THE FEASIBILITY AND  
POTENTIAL OF THE GROUND EFFECT TAKE-OFF AND LANDING (GETOL)  
CONFIGURATION.

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL No. /ZOM08

AD-421 955

GENERAL DYNAMICS/CONVAIR SAN DIEGO CALIF

GETOL RESEARCH PROGRAM.

(U)

DESCRIPTIVE NOTE: FINAL REPT.

AUG 63 165P

REPT. NO. GDC-62-370

CONTRACT: DA-44-177-TC-722

PROJ: DA-1-D-121401-A-147

TASK: 1-D-121401-A-14701

MONITOR: TRECOM TR-63-1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (SHORT TAKE-OFF PLANES, AERODYNAMIC CHARACTERISTICS), MODEL TESTS, HOVERING, CONTROL, BASE FLOW, PRESSURE, TAKE-OFF, THRUST VECTOR CONTROL SYSTEMS, PITCH (MOTION), LOAD DISTRIBUTION, SLOTTED FLAPS, ANGLE OF ATTACK, WIND TUNNEL MODELS, GROUND EFFECT MACHINES, DEFLECTION, INLET GUIDE VANES, TAILS (AIRCRAFT), DRAG, LANDINGS, YAW, ROLL, NOZZLES, EXHAUST NOZZLES, GROUND EFFECT (U)  
IDENTIFIERS: 1963; GETOL (U)

RESULTS ARE PRESENTED FOR AN EXPERIMENTAL RESEARCH PROGRAM TO DETERMINE THE AERODYNAMIC CHARACTERISTICS OF A GROUND-EFFECT TAKE-OFF AND LANDING (GETOL) AIRCRAFT AND TO ASCERTAIN THE FEASIBILITY AND POTENTIAL OF A GETOL AIRCRAFT SYSTEM. THE OBJECTIVE OF THE GETOL CONCEPT IS TO PRODUCE AN AIRCRAFT THAT WOULD ELIMINATE CONVENTIONAL LANDING GEAR AND PROVIDE A CAPABILITY FOR TAKE-OFF AND LANDING OVER UNPREPARED TERRAIN. THE PROGRAM INCLUDED STATIC-ROOM AND WIND-TUNNEL TESTING. THE DATA AND RESULTS FROM THE TESTS PROVIDED THE BASIS FOR THE DESIGN ANALYSIS AND LAYOUTS OF THE GETOL AIRCRAFT STUDY CONTAINED IN THIS REPORT. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-426 13U

MISSISSIPPI STATE UNIV STATE COLLEGE

THE MARVEL PROJECT. THE MARVELETTE AIRPLANE  
BACKGROUND AND DESCRIPTION.

(U)

NOV 63 25P

CONTRACT: DA-44-177-AMC-892(T)

PROJ: DA-1-D-121401-A-142

TASK: 1-D-121401-A-14203

MONITOR: TRECOT TR-63-54

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (•SHORT TAKE-OFF PLANES, RESEARCH PLANES);  
(•RESEARCH PLANES, SHORT TAKE-OFF PLANES), ARMY  
AIRCRAFT, FEASIBILITY STUDIES, DESIGN, SHROUDED  
PROPELLERS, TAILS (AIRCRAFT), RING WINGS, FLIGHT  
TESTING, BOUNDARY LAYER CONTROL SYSTEMS, SUCTION  
SLOTS

(U)

IDENTIFIERS: 1963; MARVELETTE AIRCRAFT, MARVEL  
PROJECT, AG-14 AIRCRAFT, XAZ-1 AIRCRAFT

(U)

A RESEARCH PROJECT CURRENTLY BEING UNDERTAKEN AT  
MISSISSIPPI STATE UNIVERSITY IS REPORTED IN  
WHICH AN AERODYNAMIC RESEARCH AIRCRAFT, THE MARVEL,  
IS BEING DESIGNED TO EXPLORE THE PROBLEM AREAS  
INHERENT IN STOL FIXED-WING AIRCRAFT. AFTER  
SEVERAL YEARS OF EXPERIMENTATION WITH MODIFIED OFF-  
THE-SHELF AIRCRAFT, IT BECAME EVIDENT THAT FULL  
EVALUATION OF NEW STOL DESIGN TECHNIQUES WAS  
SEVERELY LIMITED BY BASIC CONFIGURATIONS OF AVAILABLE  
AIRCRAFT AND THAT AN AIRCRAFT INCORPORATING THE LATEST  
TECHNIQUES IN ITS BASIC CONFIGURATION SHOULD BE  
DESIGNED AND TESTED. AS AN INTERIM STEP TOWARD  
REFINEMENT OF THE MARVEL DESIGN, A TEST BED  
AIRCRAFT, THE MARVELETTE (XAZ-1), HAS BEEN  
DESIGNED, BUILT AND FLOWN. THIS REPORT PRESENTS THE  
BACKGROUND HISTORY OF THE MARVEL AND THE  
DESCRIPTION OF THE MARVELETTE. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-426 377

ADVISORY GROUP FOR AERONAUTICAL RESEARCH AND DEVELOPMENT  
PARIS (FRANCE)

AERODYNAMIC ASPECTS OF BOUNDARY LAYER CONTROL FOR  
HIGH LIFT AT LOW SPEEDS, (U)

JAN 63 67P WILLIAMS, J. BUTLER, S. F. J.

MONITOR: AGARD 414

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PRESENTED AT THE AIRCRAFT TAKE-  
OFF AND LANDING SPECIALISTS' MEETING SPONSORED BY  
THE AGARD FLIGHT MECHANICS PANEL, 15-18 JAN 63,  
PARIS.

DESCRIPTORS: (BOUNDARY LAYER CONTROL SYSTEMS,  
AERODYNAMIC CHARACTERISTICS), (SHORT TAKE-OFF PLANES,  
BOUNDARY LAYER CONTROL SYSTEMS), TRAILING CONTROL  
SURFACES, JET FLAPS, SUCTION SLOTS, AERODYNAMIC  
CONFIGURATIONS, AIRFOILS, SUPERSONIC AIRFOILS, LIFT,  
PITCH (MOTION), DRAG, LAMINAR FLOW, FLIGHT TESTING,  
LANDINGS, TAKE-OFF, PERFORMANCE (ENGINEERING), FLAPS,  
COANDA EFFECT (U)  
IDENTIFIERS: 1963 (U)

THE USEFULNESS OF BOUNDARY-LAYER CONTROL  
(B.L.C.) AT THE KNEE OF A TRAILING-EDGE FLAP, OVER  
THE WING NOSE CLOSE TO THE LEADING EDGE OR AT THE  
KNEE OF A LEADING-EDGE FLAP IS FIRST NOTED. VARIOUS  
METHODS OF PROVIDING B.L.C. ARE OUTLINED,  
COMPRISING SLOT BLOWING, SLOT SUCTION, AREA SUCTION,  
INCLINED AIR-JETS, AND SPECIALLY DESIGNED AEROFOIL  
SHAPES. THE AERODYNAMIC ASPECTS OF SLOT BLOWING  
OVER TRAILING-EDGE FLAPS AND THE WING NOSE ARE THEN  
EXAMINED IN DETAIL, AND BOTH SLOT SUCTION AND AREA  
SUCTION ARE ALSO CONSIDERED. THE ASSOCIATED  
PRACTICAL DESIGN FEATURES REQUIRED FOR GOOD  
PERFORMANCE ARE DISCUSSED AND SOME FLIGHT-HANDLING  
IMPLICATIONS ARE MENTIONED. (AUTIOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOR

AD-426 783

TORONTO UNIV (ONTARIO) INST FOR AEROSPACE STUDIES

PERFORMANCE AND OPERATION OF QUASI TWO DIMENSIONAL  
JET FLAPS,

(U)

NOV 63 52P KORBACHER, G.K.:  
REPT. NO. REPT. 90  
CONTRACT: DA-TC-44-177-G1  
PROJ: DA-1-D-121401-A-142  
TASK: 1-D-121401-A-14224  
MONITOR: TRECOM TR-63-58

UNCLASSIFIED REPORT

DESCRIPTORS: (JET FLAPS, AERODYNAMIC CONTROL  
SURFACES), (SHORT TAKE-OFF PLANES, JET FLAPS),  
TWO DIMENSIONAL FLOW, RECOVERY, THRUST, LIFT,  
DRAG, WINGS, OPTIMIZATION, ANGLE OF ATTACK,  
MATHEMATICAL ANALYSIS, AERODYNAMIC CHARACTER  
ISTICS, FLUID FLOW, EXPERIMENTAL DATA, DE  
FLECTION, AERODYNAMIC CONFIGURATIONS, DESIGN,  
THEORY, VELOCITY.  
IDENTIFIERS: 1963.

(U)

(U)

TRUE TWO-DIMENSIONAL AND QUASI TWO-DIMENSIONAL JET-  
FLAP TEST RESULTS ARE EVALUATED FOR EXPERIMENTAL  
EVIDENCE IN FAVOR OR AGAINST THE ONCE MUCH-DISPUTED  
JET-FLAP THRUST HYPOTHESIS. THE THRUST HYPOTHESIS  
IS VERIFIED EXPERIMENTALLY AS CONCLUSIVELY AS IT HAS  
BEEN PROVEN THEORETICALLY. THE DEVELOPMENT IS  
PRESENTED OF JET-FLAP CHARACTERISTICS FOR TRULY AND  
QUASI TWO-DIMENSIONAL JET-FLAPPED WINGS. FOR ANY  
DESIRED LIFT, IT RENDERS ANY NUMBER OF COMBINATIONS  
OF RATE OF BLOWING, JET-DEFLECTION ANGLE, AND ANGLE  
OF ATTACK WHICH CAN PRODUCE THIS LIFT. BESIDES, IT  
PERMITS THAT AMOUNT OF THE JET-SHEET THRUST WHICH CAN  
BE RECOVERED AS PROPULSIVE THRUST OR WHICH IS  
NULLIFIED BY THE DRAG OF THE JET-FLAPPED WING TO BE  
READ OFF SIMULTANEOUSLY. THE RATIO OF THESE VALUES  
REFLECTS ON THE PERFORMANCE AND ECONOMY OF OPERATION  
OF THIS WING. IF THEN, THE PRODUCTION OF A  
SPECIFIC LIFT IS OPTIMIZED WITH RESPECT TO THE LOWEST  
EXPENDITURE IN BLOWING AT THE SMALLEST POSSIBLE DRAG,  
AN "OPERATING LINE" CAN BE DEFINED AND ADDED TO THE  
JET-FLAP CHARACTERISTICS. THE RANGE OF  
ECONOMICAL JET-FLAP OPERATION WAS FOUND TO COINCIDE  
WITH THE REGION IN WHICH ANY CHANGE IN THE RATE OF  
BLOWING RESULTS IN EXACTLY THE SAME CHANGE IN THE  
MEASURED THRUST. (AUTHOR)

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UNCLASSIFIED

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UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-430 063

DOUGLAS AIRCRAFT CO INC LONG BEACH CALIF

A STUDY OF ROUGH-TERRAIN-INDUCED STRUCTURAL LANDING  
LOADS. (U)

DEC 63 181P

CONTRACT: DA-44-177-TC-735

PROJ: DA-1-D-121401-A-146

TASK: 1-D-121401-A-14602

MONITOR: TRECOM TR-63-68

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (AIRPLANE LANDINGS, LOADING (MECHANICS)),  
(SHORT TAKE-OFF PLANES, AIRPLANE LANDINGS), STRUCTURES,  
WEIGHT, TERRAIN, LANDING GEAR, LANDING IMPACT (U)  
IDENTIFIERS: 1963, V-1 AIRCRAFT (U)

AN INVESTIGATION WAS MADE OF THE EFFECT OF ROUGH  
TERRAIN ON THE LOADS, WEIGHTS, AND PERFORMANCE OF THE  
OV-1 AIRPLANE DURING LANDINGS. THE LOAD  
CALCULATIONS, WHICH WERE CONDUCTED ON AN IBM 7090  
COMPUTER, CONSIDERED THE INTERNAL OPERATING MECHANISM  
OF THE LANDING GEAR AND THE FLEXIBILITIES OF THE GEAR  
AND STRUCTURE AS A MUTUALLY INTERACTING DYNAMIC  
SYSTEM. THE EQUATIONS OF MOTION AND CERTAIN  
DETAILS OF THE COMPUTER PROGRAM ARE PROVIDED. A  
DETERMINATION WAS MADE OF THE TERRAIN ROUGHNESS AT  
WHICH MODIFICATION TO THE AIRPLANE WAS CONSIDERED  
NECESSARY AND THE TERRAIN ROUGHNESS AT WHICH THE  
REDUCED PERFORMANCE OF THE OV-1 AIRPLANE, DUE TO  
INCREASED WEIGHT, BECAME EQUAL TO OR INFERIOR TO A  
VTOL AIRCRAFT OF EQUAL WEIGHT. THIS WORK WAS  
CONCERNED WITH THE DETERMINATION OF MAXIMUM LOADS  
AND CORRESPONDING WEIGHT AND PERFORMANCE PENALTIES;  
HOWEVER, OBSERVATIONS WERE MADE REGARDING THE  
IMPORTANCE OF REPEATED LOADS DURING LANDING OR  
TAXIING ON SURFACES WITH MULTIPLE IRREGULARITIES.  
THE PRIMARY RESULTS OF THE INVESTIGATION SHOW THE  
TERRAIN ROUGHNESS AT WHICH STRUCTURAL REINFORCEMENT  
IS CONSIDERED NECESSARY AND THE TERRAIN ROUGHNESS AT  
WHICH THE PERFORMANCE OF THE AIRPLANE BECOMES EQUAL  
TO THAT OF A VTOL AIRCRAFT OF THE SAME WEIGHT.  
(AUTHOR) (U)

UNCLASSIFIED

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-452 582

ARMY AIRBORNE ELECTRONICS AND SPECIAL WARFARE BOARD FORT  
BRAGG N C

INTEGRATED ENGINEERING/SERVICE TEST OF LOW LEVEL  
EXTRACTION TECHNIQUES (LOLEX) FROM CV-28 AIRCRAFT. (U)

DESCRIPTIVE NOTE: FINAL REPT.

SEP 64 1V

REPT. NO. AB5563

PROJ: USATECOM4 4 7475

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*AIR DROP OPERATIONS, LOW ALTITUDE),  
(\*SHORT TAKE-OFF PLANES, AIR DROP OPERATIONS), RELEASE  
MECHANISMS, FLIGHT TESTING, AVIATION SAFETY,  
RELIABILITY, PERFORMANCE (ENGINEERING), PARACHUTES (U)  
IDENTIFIERS: V-2 AIRCRAFT, EXTRACTION (U)

THIS REPORT OF TEST INCLUDES RESULTS OF FLIGHT  
SAFETY, ENGINEER, AND SERVICE TEST OF LOW LEVEL  
EXTRACTION TECHNIQUES (LOLEX) FOR AIR DELIVERY  
OF ARMY SUPPLIES AND EQUIPMENT FROM CV-28  
AIRCRAFT. TESTS NR 1 AND 4 - 9 WERE THE SERVICE  
TEST PHASE OF THE TEST CONDUCTED BY THE USAAESW  
BOARD, EXECUTIVE TEST AGENCY, UNDER FIELD  
CONDITIONS AT FORT BRAGG, NORTH CAROLINA,  
DURING THE PERIOD 26 MAY TO 26 JUNE 1964. TEST  
NR 2 WAS THE FLIGHT ENGINEER TEST PHASE CONDUCTED  
BY USAATA, SUPPORTING TEST AGENCY, AT EDWARDS  
AFB, CALIFORNIA, DURING THE PERIOD 10 MARCH TO 3  
APRIL 1964. TEST NR 3 WAS THE ENGINEER TEST  
PHASE CONDUCTED BY YPG, SUPPORTING TEST AGENCY,  
AT YUMA, ARIZONA, DURING THE PERIOD 6 - 29  
APRIL 1964. THE USAAVNTB, SUPPORTING TEST  
AGENCY, WITH PRIMARY INTEREST IN AIRCRAFT  
OPERATIONS AND CREW PROCEDURES, PARTICIPATED IN ALL  
TESTS. THE USAQMS (ABN), WITH PRIMARY INTEREST  
IN PUBLICATION OF TECHNIQUES AND PROCEDURES, OBSERVED  
ALL SERVICE TESTS. (AUTHOR) (U)

UNCLASSIFIED

/ZOMOB

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-457 142

LING-TEMCO-VOUGHT INC DALLAS TEX

FEASIBILITY STUDY, XC-142A MODIFIED FOR OPEN OCEAN  
OPERATION, (U)

FEB 65 188P MARSH, K. R. I  
REPT. NO. 2-55400/4R-963  
CONTRACT: NOW-64-0500

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*SHORT TAKE-OFF PLANES, SEAPLANES),  
(\*VERTICAL TAKE-OFF PLANES, SEAPLANES), (\*SEAPLANES,  
TRANSPORT PLANES), FEASIBILITY STUDIES, SEAPLANE FLOATS,  
INFLATABLE STRUCTURES, ANTISUBMARINE AIRCRAFT, OCEANS,  
OPERATION, AIRPLANE LANDINGS, LOADING (MECHANICS),  
IMPACT SHOCK, LANDING GEAR, STRUCTURES, AIRFRAMES, TEST  
WINGS, FUSELAGES, HULLS (MARINE), HYDRODYNAMICS,  
AERODYNAMIC CONFIGURATIONS, WEIGHT, DESIGN, DATA,  
GRAPHICS (U)  
IDENTIFIERS: C-142 AIRCRAFT, V-464 AIRCRAFT,  
GRAPHS (U)

A STUDY HAS BEEN PERFORMED TO DETERMINE THE  
FEASIBILITY OF DEVELOPING A SEAPLANE VERSION OF THE  
MODEL XC-142A AIRPLANE. A STOL SEAPLANE  
VERSION AND VTOL SEAPLANE VERSION OF THE MODEL  
XC-142A AIRPLANE, BOTH FITTED WITH INFLATABLE  
VERTICAL FLOATS, WERE STUDIED, AND THE FEASIBILITY OF  
DEVELOPING BOTH OF THESE AIRPLANES WAS ESTABLISHED.  
AS A RESULT OF THIS FEASIBILITY STUDY, IT IS  
RECOMMENDED THAT FURTHER ENGINEERING WORK BE DONE TO  
ESTABLISH THE VALIDITY OF THE ASSUMPTIONS USED IN  
THIS STUDY. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-482 115 1/3 20/4  
WASHINGTON UNIV SEATTLE

THE STUDY OF OPERATIONAL PROBLEMS AND TECHNIQUES IN  
WIND TUNNEL TESTING OF VTOL AND STOL VEHICLES. (U)

DESCRIPTIVE NOTE: PROGRESS REPT. NO. 4, 31 MAR-1 OCT  
65,

OCT 65 4P RAE, WILLIAM H. JR.  
CONTRACT: DA-ARO(D)-31-124-G481  
PROJ: 4506-E

UNCLASSIFIED REPORT

DESCRIPTORS: (•SHORT TAKE-OFF PLANES, AERODYNAMIC  
CHARACTERISTICS), (•VERTICAL TAKE-OFF PLANES,  
AERODYNAMIC CHARACTERISTICS), DUCTED FANS, ROTOR  
BLADES(ROTARY WINGS), SIMULATION, WALLS,  
PERFORMANCE(ENGINEERING), TILT WINGS,  
AERODYNAMIC CONFIGURATIONS, AIRPLANE MODELS, MODEL  
TESTS, WIND TUNNEL MODELS, TEST METHODS, WIND  
TUNNELS, GAS FLOW, BOUNDARY LAYER (U)

THE PRIMARY PURPOSE OF THIS INVESTIGATION IS TO  
DEVELOP AN ECONOMICAL METHOD OF EXPERIMENTALLY  
CHECKING THE EFFECT OF WIND TUNNEL WALL CONSTRAINTS  
ON ROTORS, DUCTED FANS, TILT PROPS, AND OTHER METHODS  
OF OBTAINING AIRCRAFT WITH V/STOL PERFORMANCE, BY  
THE USE OF INSERTS WITHIN A WIND TUNNEL TO SIMULATE  
DIFFERENT SIZE TEST SECTIONS. (AUTHOR) (U)

UNCLASSIFIED

/ZOMOB

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOR

AD-600 500

FULTON (ROBERT E) JR NEWTON CONN

FULTON AIR-TO-GROUND PICKUP SYSTEM FOR CARIBOU  
AIRCRAFT.

(U)

FEB 64 52P

CONTRACT: DA44 177TC804

TASK: 1D141812XX02

MONITOR: TRECOM

TR64 17

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*AERIAL PICKUP SYSTEMS, FLIGHT TESTING),  
(\*SHORT TAKE-OFF PLANES, AERIAL PICKUP SYSTEMS),  
AIRCRAFT EQUIPMENT, AIR-SEA RESCUES, BALLOONS (U)

THE REPORT CONTAINS OBSERVATIONS, RECOMMENDATIONS,  
AND CONCLUSIONS REGARDING THE JOINT ENGINEER-USER  
TESTS OF THE FULTON AIR-TO-GROUND PICKUP  
SYSTEM. ALSO INCLUDED ARE THE HISTORICAL  
BACKGROUND OF THE SYSTEM, THE PRINCIPLE OF OPERATION,  
AND A DESCRIPTION OF THE EQUIPMENT EMPLOYED. THE  
TEST SERIES WAS SATISFACTORILY COMPLETED AND  
JUSTIFIES CONCLUDING THE RECOVERY SYSTEM IS SAFE,  
RELIABLE, AND READY FOR USE WITH THE CARIBOU  
AIRCRAFT TO RECOVER PERSONNEL AND EQUIPMENT FROM LAND  
AND FROM WATER. (AUTHOR) (U)

UNCLASSIFIED

/ZOMOR

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-601 051

UNITED AIRCRAFT CORP STRATFORD CONN SIKORSKY AIRCRAFT  
DIV

STRUCTURAL DYNAMIC RESPONSE OF LARGE LOGISTIC V/STOL  
VEHICLES. (U)

DESCRIPTIVE NOTE: TECHNICAL DOCUMENTARY REPT., JUN 62-  
FEB 64,

APR 64 203P RICH, M. J. IJEPSON, W. D. I  
BUFFALANO, A. C. I STEBBINS, R. F. I

CONTRACT: AF 33(657)-8452

PROJ: AF-1370

TASK: 137008

MONITOR: AFFDL

TDR-64-44

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (•VERTICAL TAKE-OFF PLANES, LOADING  
(MECHANICS)), (•SHORT TAKE-OFF PLANES, LOADING  
(MECHANICS)), AERODYNAMIC CHARACTERISTICS, AERODYNAMIC  
CONFIGURATIONS, MATHEMATICAL ANALYSIS, STRUCTURAL  
PROPERTIES, DESIGN, AERODYNAMIC LOADING, GUST LOADS,  
TAKE-OFF, LANDING IMPACT, MANEUVERABILITY, WEIGHT,  
TRANSPORT PLANES, VIBRATION (U)

PRELIMINARY DESIGNS ARE EVOLVED FOR FIVE LARGE  
LOGISTIC V/STOL CONFIGURATIONS. STRUCTURAL  
ELASTIC CHARACTERISTICS AND MASS DISTRIBUTIONS ARE  
CALCULATED. THE STRUCTURAL DYNAMIC RESPONSE IS  
INVESTIGATED FOR GROUND LANDING, TAKE-OFF ABORT,  
MANEUVERS, GUST PENETRATION AND LANDING CONDITIONS.  
THE RESULTS OF THIS INVESTIGATION ARE TABULATED IN  
A MATRIX SHOWING THE DEGREE AND RELATIVE CRITICALNESS  
FOR THE CONDITIONS AND THE V/STOL CONFIGURATIONS.  
THE DEGREE OF CRITICALNESS IS ESTABLISHED AS THE  
RATIO OF THE PEAK DYNAMIC LOADING AND/OR STRESS TO  
THE VALUES USED IN THE CONFIGURATION DESIGN  
STRUCTURAL STUDY. THE LATTER STRUCTURAL LOADS AND/  
OR STRESSES ARE EVOLVED THROUGH THE USE OF EXISTING  
MILITARY SPECIFICATIONS OR NORMAL DESIGN PRACTICES.  
(AUTHOR) (U)

UNCLASSIFIED

/ZOM08

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-603 375

BUREAU OF NAVAL WEAPONS HYDROBALLISTICS ADVISORY COMMITTEE  
WASHINGTON DC

ESTIMATION OF STOL A/C TAKE-OFF DISTANCES. (U)

DESCRIPTIVE NOTE: WEAPONS SYSTEMS ANALYSIS DIV.  
REPT.,

AUG 64 22P THIBAUT, E. A. I  
MONITOR: NAVWEPS, RS 64 17

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*TAKE-OFF, MATHEMATICAL PREDICTION),  
(\*SHORT TAKE-OFF PLANES, TAKE-OFF), ROLL, DATA,  
CORRELATION TECHNIQUES (U)

THE STUDY WAS UNDERTAKEN TO FIND AN EASY-TO-USE  
TAKE-OFF DISTANCE PREDICTION METHOD AND TO EVALUATE  
ITS APPLICABILITY TO STOL AIRCRAFT. FOR THE  
PURPOSES OF THE STUDY STOL AIRCRAFT WERE DEFINED AS  
THOSE REQUIRING A TAKE-OFF GROUND ROLL OF LESS THAN  
1000 FT. TWO EXISTING TAKE-OFF GROUND ROLL  
ESTIMATE METHODS WERE EVALUATED BY COMPARING  
PREDICTED VALUES WITH AVAILABLE DATA FOR SEVERAL  
STOL AIRCRAFT. THE RESULTING ACCURACIES WERE  
RESPECTIVELY WITHIN 9% AND 11% ERROR. IT WAS  
FOUND THAT ONE OF THESE METHODS COULD BE FURTHER  
SIMPLIFIED AND YET STILL YIELD ACCEPTABLE RESULTS.  
THAT IS, EXCLUDING TWO PREDICTIONS THIS SIMPLIFIED  
METHOD YIELDED AN ACCURACY WITHIN 13% ERROR. IN  
ADDITION, SOME CORRELATION WAS FOUND TO EXIST BETWEEN  
SHORT TAKE-OFF GROUND ROLL AND TOTAL DISTANCE OVER A  
50 FT OBSTACLE. AS A RESULT AN EXPRESSION WAS  
DERIVED RELATING THE TWO. (AUTHOR) (U)

UNCLASSIFIED

/ZOM08

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDMOA

AD-608 186

DYNASCIENCES CORP FORT WASHINGTON PA

EFFECTS OF PROPELLER SLIPSTREAM ON V/STOL AIRCRAFT  
PERFORMANCE AND STABILITY. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT. FOR 24 APR 63-4 MAR  
64,

AUG 64 124P GOLAND, L. MILLER, N. BUTLER,

L. I

REPT. NO. DCR-137

CONTRACT: DA44 177AMC48T

TASK: ID121401A:4203

MONITOR: TRECOM, TR64 47

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (•SHORT TAKE-OFF PLANES, PERFORMANCE  
(ENGINEERING)), (•VERTICAL TAKE-OFF PLANES, PERFORMANCE  
(ENGINEERING)), (•PROPELLERS (AERIAL); AERODYNAMIC  
CHARACTERISTICS), (•WINGS, AERODYNAMIC CHARACTERISTICS),  
AERODYNAMIC LOADING, AERODYNAMIC CONFIGURATIONS, TAKE-  
OFF, LANDINGS, CONTROL, STABILITY, MATHEMATICAL  
ANALYSIS, LIFT, DRAG, DELTA WINGS, FLIGHT, THEORY,  
STALLING (U)  
IDENTIFIERS: SLIPSTREAM (U)

PRESENTED IS AN ANALYTICAL INVESTIGATION OF THE  
AERODYNAMIC FORCES ACTING ON WING-PROPELLER  
COMBINATIONS INCLUDING THE EFFECTS OF PROPELLER  
SLIPSTREAMS. THE RESULTS OF THE DEVELOPED THEORY  
ARE THEN APPLIED TO TYPICAL TWO- AND FOUR-PROPELLER  
VTOL AND STOL WING CONFIGURATIONS. CORRELATION  
WITH EXISTING TEST DATA IS SHOWN TO BE SATISFACTORY.  
CONSIDERATION IS ALSO GIVEN TO SUCH ASSOCIATED  
ITEMS AS THE EFFECTS OF THE SLIPSTREAM ON (1)  
WING STALL (2) AIRCRAFT TAKE-OFF AND LANDING  
PERFORMANCE AND (3) AIRCRAFT STABILITY AND  
CONTROL. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-608 515

TORONTO UNIV (ONTARIO) INST FOR AEROSPACE STUDIES

PERFORMANCE, OPERATION, AND USE OF LOWASPECT-RATIO  
JET-FLAPPED WINGS. (U)

AUG 64 44P KORBACHER, G. K. I  
REPT. NO. UTIAS-97  
CONTRACT: DA 44 177 AMC 63 G9  
TASK: 1D12:401A:4203  
MONITOR: TRECOM . TR64 38

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*WINGS, JET FLAPS), (\*JET FLAPS,  
OPERATION), (\*SHORT TAKE-OFF PLANES, WINGS), ASPECT  
RATIO, MATHEMATICAL ANALYSIS, PROPULSION, DRAG, LIFT,  
PERFORMANCE (ENGINEERING) (U)

THE CHARACTERISTICS OF A JET-FLAPPED WING OF ASPECT  
RATIO 6 ARE PRESENTED, DISCUSSED, AND EVALUATED FOR  
STOL APPLICATION. AGAIN, AS FOR HIGH-ASPECT-  
RATIO (AR = 20) JET-FLAPPED WINGS, A RANGE FOR  
THE MOST ECONOMICAL JETFLAP OPERATION IS WELL  
DEFINED. THE ANGLE OF ATTACK AS AN EFFICIENT MEANS  
OF LIFT PRODUCTION LOSES ITS USEFULNESS WITH LOW-  
ASPECT-RATIO JET-FLAPPED WINGS, WHEREAS THE OPTIMUM  
JET-DEFLECTION ANGLE SEEMS HARDLY AFFECTED. A MOST  
EFFICIENT JET-FLAP APPLICATION FOR STOL CALLS FOR A  
COMPLETE INTEGRATION OF THE LIFTING AND PROPULSIVE  
SYSTEMS. IN THE RANGE OF MOST ECONOMICAL JET-FLAP  
OPERATION, SEMIEMPIRICAL RELATIONSHIPS PREDICT  
PARAMETER CHANGES ACCURATELY ENOUGH FOR PRACTICAL  
PURPOSES. (AUTHOR) (U)

UNCLASSIFIED

/ZOMOB



UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-612 906

PRINCETON UNIV N J DEPT OF AEROSPACE AND MECHANICAL  
SCIENCES

PRELIMINARY DESIGN CONSIDERATIONS FOR A V/STOL WIND  
TUNNEL. (U)

DESCRIPTIVE NOTE: FINAL REPT. FOR 1 JUL 63-31 A' 4.  
JAN 65 40P KNOWLTON, MARCUS P. I

CONTRACT: AF33 657 12174

PROJ: 8219

TASK: 821907

MONITOR: AFFDL TDR-64-146

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (WIND TUNNELS, DESIGN), AIRPLANE MODELS,  
VERTICAL TAKE-OFF PLANES, SHORT TAKE-OFF PLANES, POWER,  
COSTS, COOLING, HONEYCOMB CORES (U)

THE REPORT DESCRIBES A TANDEM TEST SECTION LOW  
SPEED WIND TUNNEL AND THE ATTRIBUTES AND DESIGN  
CONSIDERATIONS OF USING EITHER AN OPEN RETURN OR  
CLOSED RETURN. POWER AND COST ESTIMATES ARE MADE.  
(AUTHOR) (U)

UNCLASSIFIED

/ZOMOB

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM08

AD-613 523

LEAR SIEGLER INC GRAND RAPIDS MICH INSTRUMENT DIV

STATE OF THE ART FOR V/STOL CONTROL DISPLAY. (U)

DESCRIPTIVE NOTE: INTERIM REPT.

OCT 63 6SP

REPT. NO. GRR-1445

CONTRACT: AF33 657 11740

PROJ: 6190

TASK: 619005

MONITOR: RTD , TDR63-4167

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (•VERTICAL TAKE-OFF PLANES, REVIEWS),  
(•SHORT TAKE-OFF PLANES, REVIEWS), DISPLAY SYSTEMS,  
CONTROL SYSTEMS, PROPULSION, FEASIBILITY STUDIES,  
AERODYNAMIC CHARACTERISTICS, SIMULATION, AIRCRAFT  
ENGINES, INSTRUMENTATION, HOVERING, FLIGHT TESTING (U)

A SURVEY WAS CONDUCTED TO ESTABLISH THE 'STATE-OF-THE-ART' IN V/STOL CONTROL-DISPLAY DEVELOPMENT AND APPLICATION. VISITATIONS WERE MADE TO FIFTEEN UNITED STATES FIRMS AND GOVERNMENT AGENCIES ACTIVELY ENGAGED IN V/STOL DEVELOPMENT AND DATA CORRELATED WITH REPORTED EUROPEAN V/STOL DEVELOPMENT. MOST RESEARCH ACTIVITY TO DATE HAS BEEN CONCERNED WITH PROPULSION FEASIBILITY AND AIRCRAFT AERODYNAMIC CHARACTERISTICS WITH LITTLE EMPHASIS ON CONTROL-DISPLAY SUB-SYSTEMS ANALYSIS. SOME V/STOL SIMULATION HAS BEEN CONDUCTED, PRIMARILY IN THE AREAS OF ALTITUDE CONTROL DURING THE HOVER PHASE. AREAS REQUIRING INTENSIVE CONTROL-DISPLAY ANALYSIS TO FULLY UTILIZE THE UNIQUE V/STOL CAPABILITIES INCLUDE: ENGINE INSTRUMENTATION, LOW AIR SPEED SENSING AND DISPLAY, WING STALL CONDITION AND ANGLE OF ATTACK DURING TRANSITION PHASES, VISIBILITY REQUIREMENTS, AND TERMINAL GUIDANCE REQUIREMENTS. (AUTHOR) (U)

UNCLASSIFIED

/ZDM08

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-614 585

MCDONNELL AIRCRAFT CORP ST LOUIS MO

STOL-V/STOL CITY CENTER TRANSPORT AIRCRAFT  
STUDY.

(U)

DESCRIPTIVE NOTE: FINAL REPT.

OCT 64 174P

REPT. NO. B-122

CONTRACT: FA64WAS012

MONITOR: FAA-ADS ,

26

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*AIR TRAFFIC ANALYSIS), (\*CIVIL AVIATION;  
ECONOMICS), (\*VERTICAL TAKE-OFF PLANES, CIVIL AVIATION),  
(\*SHORT TAKE-OFF PLANES, CIVIL AVIATION), (\*TRANSPORT  
PLANES, FEASIBILITY STUDIES), COSTS, URBAN AREAS,  
ELECTRONIC EQUIPMENT, DESIGN, AIRPORTS, FACTOR ANALYSIS,  
AIRCRAFT ENGINES, STATISTICAL DATA (U)

THIS IS PART OF A STUDY TO INVESTIGATE THE ECONOMIC  
FEASIBILITY OF STOL AND V/STOL TRANSPORT AIRCRAFT  
OPERATION FROM CITY CENTER TO CITY CENTER. A  
COMPARISON IS MADE OF DESIGN, PERFORMANCE, AND DIRECT  
OPERATING COSTS OF TWO V STOL AND TWO STOL  
TRANSPORT AIRCRAFT TO BE OPERATIONAL IN 1975. THE  
V/STOL AIRCRAFT IN THE STUDY ARE A TILT WING-  
PROPELLER TYPE AND A TURBOFAN LIFT ENGINE TYPE. THE  
STOL AIRCRAFT ARE THE PROPELLER DEFLECTED  
SLIPSTREAM TYPE AND A STOL VERSION OF THE TILT  
WING-PROPELLER TYPE. PROPULSION SYSTEMS ARE  
PROJECTED TO A TECHNOLOGICAL LEVEL THAT COULD BE  
EMPLOYED IN AN AIRCRAFT DESIGN INITIATED IN 1970.  
MICROMINIATURIZATION OF ELECTRONIC EQUIPMENT IS  
INCORPORATED TO THE DEGREE THAT IS CONSIDERED  
ACCEPTABLE OPERATIONALLY AND COST-WISE BY 1975.  
ALL AIRCRAFT ARE DESIGNED FOR A STAGE LENGTH OF 500  
STATUTE MILES, AND PERFORMANCE AND DIRECT OPERATING  
COSTS ARE SHOWN FOR STAGE LENGTHS OF 50 TO 750 MILES  
AND FOR AIRCRAFT GROSS WEIGHTS OF 40,000 TO 100,000  
POUNDS. TYPICAL THREE-VIEWS ARE SHOWN FOR ONE SIZE  
OF EACH OF THE FOUR AIRCRAFT. THE RESULTS OF THE  
PARAMETRIC SIZING STUDY OF EACH AIRCRAFT ARE SHOWN AS  
GROUP WEIGHT BREAKDOWNS, MISSION PERFORMANCE,  
DIMENSIONAL TABULATIONS AND CURVES, NOISE LEVEL  
PROFILES, AND TAKE-OFF AND LANDING CHARACTERISTICS.  
(AUTHOR)

(U)

UNCLASSIFIED

/ZOM08

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-614 598

STANFORD RESEARCH INST MENLO PARK CALIF

AN ECONOMIC ANALYSIS OF COMMERCIAL VTOL AND STOL  
TRANSPORT AIRCRAFT.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,

FEB 65 236P

WALDO, RICHARD K. ITILTON,

PETER D. I

CONTRACT: FA64WA4997

PROJ: ISU4922

MONITOR: FAA-ADS ,

25

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DESCRIPTORS: (\*TRANSPORT PLANES, FEASIBILITY STUDIES),  
(\*CIVIL AVIATION, ECONOMICS), (\*AIR TRAFFIC, ANALYSIS),  
(\*VERTICAL TAKE-OFF PLANES, CIVIL AVIATION), (\*SHORT  
TAKE-OFF PLANES, CIVIL AVIATION), AIR TRAFFIC CONTROL  
SYSTEMS, AIRPORTS, FACTOR ANALYSIS, URBAN AREAS,  
STATISTICAL DATA, COSTS, DESIGN (U)

ON THE BASIS OF THE RESEARCH UNDERTAKEN IN THE  
PRELIMINARY STUDY, IT WOULD APPEAR THAT THE PROVISION  
OF CITYCENTER V/STOL SERVICE WOULD REPRESENT A  
SOMEWHAT MARGINAL UNDERTAKING FROM THE STANDPOINT OF  
BOTH THE AIR CARRIER AND THE AIRCRAFT MANUFACTURING  
INDUSTRIES. THE TRAFFIC POTENTIAL FOR INTERCITY  
V/STOL SERVICES AND, ACCORDINGLY, THE MARKET  
POTENTIAL FOR COMMERCIAL V/STOL AIRCRAFT WOULD BE  
QUITE LIMITED. INDEED, THE SIZE INDICATED FOR THIS  
AIRCRAFT MARKET SUGGESTS THAT COMMERCIAL V/STOL  
DEVELOPMENT WOULD BE ATTRACTIVE ONLY AS A FOLLOW-ON  
TO A MILITARY PROGRAM. THIS OUTLOOK COULD BE  
CHANGED THROUGH SIGNIFICANT ADVANCES IN THE STATE OF  
THE ART THAT WOULD PERMIT REDUCTIONS IN DIRECT  
OPERATING COSTS AND THROUGH THE AVAILABILITY OF  
SIGNIFICANT FOREIGN MARKETS FOR V/STOL AIRCRAFT. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-614 616

TORONTO UNIV (ONTARIO) INST FOR AEROSPACE STUDIES

CHARACTERISTICS OF A RECTANGULAR WING WITH A  
PERIPHERAL JET IN GROUND EFFECT, PART III.

(U)

AUG 64 80P SURRY, D. I  
REPT. NO. UTIAS-TN-77  
CONTRACT: AF33 657 8451

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: RESEARCH SUPPORTED IN PART BY  
DEFENCE RESEARCH BOARD, OTTAWA, AND NATIONAL  
RESEARCH COUNCIL OF CANADA, OTTAWA. SEE ALSO AD-  
290 393.

DESCRIPTORS: (•SHORT TAKE-OFF PLANES, GROUND EFFECT  
MACHINES), (•GROUND EFFECT MACHINES, SHORT TAKE-OFF  
PLANES), (•WINGS, GROUND EFFECT), JETS, WIND TUNNEL  
MODELS, MODELS TESTS, LIFT, DRAG, PITCH (MOTION),  
TAKEOFF, LANDINGS, FLAPS, COANDA EFFECT, ANGLE OF  
ATTACK, VELOCITY, AERODYNAMIC CONFIGURATIONS,  
AERODYNAMICS, THRUST, STABILITY, MATHEMATICAL  
ANALYSIS

(U)

LIFT, DRAG, AND PITCHING MOMENT WERE MEASURED ON A  
RECTANGULAR WING WITH A PERIPHERAL JET IN GROUND  
EFFECT FOR THREE ANGLES OF ATTACK, THREE HEIGHTS  
ABOVE GROUND, AND FOR A RANGE OF FORWARD SPEEDS  
NECESSARY FOR TAKE-OFF CALCULATIONS. FURTHERMORE,  
NINE CONFIGURATIONS WERE TESTED IN THIS FASHION -  
EACH WITH DIFFERENT JET ANGLES AND DIFFERENT RATIOS  
OF L.E. TO T.E. JET STRENGTHS. WHEREEVER  
POSSIBLE, PROCEDURES WERE AUTOMATED AND ON-LINE DATA  
REDUCTION WAS USED. SOME FLOW VISUALIZATION TESTS  
WERE MADE ON SPECIFIC CONFIGURATIONS. THE RESULTS  
WERE USED TO STUDY AN INTEGRATED LIFT AND PROPULSION  
SYSTEM FOR AIR-CUSHION TAKE-OFF AND LANDING. THESE  
CALCULATIONS SHOWED LITTLE ADVANTAGE TO BE GAINED  
FROM USING VARIABLE JET STRENGTHS AND ANGLES DURING  
TAKE-OFF AT CONSTANT HEIGHT WHEN COMPARED TO FIXED  
CONFIGURATION RESULTS. THE LATTER USED ANGLE OF  
ATTACK, OR DIVERSION OF THRUST FROM THE CUSHION TO  
DIRECT FORWARD THRUST AS MEANS FOR KEEPING THE HEIGHT  
CONSTANT. A SIMPLE TAKE-OFF PROCEDURE IN WHICH THE  
HEIGHT IS ALLOWED TO INCREASE NATURALLY, LED TO  
SLIGHTLY POORER RESULTS, BUT ALL THE TAKEOFF  
PROCEDURES STUDIED PROVIDED SHORT-FIELD PERFORMANCE.  
(AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-615 452

MELPAR INC FALLS CHURCH VA

SIMULATION OF HELICOPTER AND V/STOL AIRCRAFT. VOLUME  
V. SUMMARY OF FINAL RESULTS. (U)

DESCRIPTIVE NOTE: SUMMARY REPT. FOR SEP 63-DEC 64.

DEC 64 17P FAITH, RUTH L. ;

CONTRACT: N61339 1205

MONITOR: NAVTRADEVCEM , 1205-5

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REQUESTED BY USERS OF DDC. COPY IS AVAILABLE FOR PUBLIC  
SALE. SEE ALSO AD-611 412.

DESCRIPTORS: (+HELICOPTERS, SIMULATION), (+HELICOPTER  
ROTORS, SIMULATION), (+VERTICAL TAKE-OFF PLANES,  
SIMULATION), (+SHORT TAKE-OFF PLANES, SIMULATION),  
MOTION, FLIGHT SIMULATORS, PROGRAMMING (COMPUTERS),  
MATHEMATICAL MODELS, ANALOG COMPUTERS, TILT WINGS,  
AIRPLANE LANDINGS, TRAINING DEVICES, NAVAL TRAINING,  
AERODYNAMIC CHARACTERISTICS, DIFFERENTIAL EQUATIONS (U)  
IDENTIFIERS: V/STOL AIRCRAFT (U)

SUMMARY OF THE RESULTS, CONCLUSIONS, AND  
RECOMMENDATIONS WHICH WERE DERIVED FROM A STUDY  
PROGRAM DESIGNED TO DEVELOP THE EQUATIONS OF MOTION  
OF HELICOPTER AND V/STOL AIRCRAFT IN A FORM  
SUITABLE FOR SIMULATION USING EITHER AN ANALOG OR A  
DIGITAL COMPUTER. (AUTHOR) (U)

UNCLASSIFIED

/ZOM08

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-617 748

ARMY AVIATION MATERIEL LABS FORT EUSTIS VA

SUGGESTED REQUIREMENTS FOR V/STOL FLYING  
QUALITIES.

(U)

DESCRIPTIVE NOTE: RESEARCH TECHNICAL MEMO. NO. 37,

JUN 65 SSP CURRY, PAUL R. MATTHEWS,

JAMES T. JR.:

REPT. NO. USAAVLABS-TR-65-45

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (•SHORT TAKE-OFF PLANES,  
PERFORMANCE(ENGINEERING)), (•VERTICAL TAKE-OFF  
PLANES, PERFORMANCE(ENGINEERING)), FLIGHT,  
SPECIFICATIONS, AERODYNAMIC CHARACTERISTICS,  
MILITARY REQUIREMENTS

(U)

THIS RESEARCH TECHNICAL MEMORANDUM PRESENTS  
SUGGESTIONS FOR A SPECIFICATION ON FLYING AND  
HANDLING QUALITIES REQUIREMENTS FOR SUBSONIC V/STOL  
AIRCRAFT. IN ADDITION TO INCLUDING THE IDEAS OF  
MANY OTHERS, THE AUTHORS HAVE INCORPORATED TWO BASIC  
SUGGESTIONS: (1) THE USE OF A PILOT RATING SYSTEM  
(SINCE THE ULTIMATE MEASURES OF HANDLING QUALITIES  
ARE DETERMINED BY THE PILOT) AND (2) THE USE OF  
SERVO-ANALYSIS TECHNIQUES AND TERMS TO DEFINE  
QUANTITATIVE REQUIREMENTS. THERE ARE NO  
STATISTICAL OR QUANTITATIVE DATA AVAILABLE TO VERIFY  
THE STATED REQUIREMENTS IN SOME CASES; HOWEVER, THE  
REQUIREMENTS ARE BASED ON MANY DIFFERENT V/STOL  
RESEARCH AIRCRAFT FUNDED BY THE U. S. ARMY AND  
FLOWN BY U. S. ARMY PILOTS. (AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-619 538

WASHINGTON UNIV SEATTLE

THE STUDY OF OPERATIONAL PROBLEMS AND TECHNIQUES IN  
WIND TUNNEL TESTING OF VTOL AND STOL VEHICLES. (U)

DESCRIPTIVE NOTE: PROGRESS REPT. NO. 3, 1 OCT 64-31

MAR 65,

MAR 65 3P RAE, WILLIAM H. , JR. I

CONTRACT: DA ARD31 124G481

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*WIND TUNNELS, EFFECTIVENESS),  
(\*VERTICAL TAKE-OFF PLANES, TESTS), (\*SHORT TAKE-  
OFF PLANES, TESTS), TEST METHODS, OPERATION,  
ROTARY WINGS, DUCTED FANS (U)

THE PRIMARY PURPOSE OF THIS INVESTIGATION IS TO  
DEVELOP AN ECONOMICAL METHOD OF EXPERIMENTALLY  
CHECKING THE EFFECT OF WIND TUNNEL WALL CONSTRAINTS  
ON ROTORS, DUCTED FANS, TILT PROPS, AND OTHER METHODS  
OF OBTAINING AIRCRAFT WITH V/STOL PERFORMANCE, BY  
THE USE OF INSERTS WITHIN A WIND TUNNEL TO SIMULATE  
DIFFERENT SIZE TEST SECTIONS. (AUTHOR) (U)

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/ZOMOB



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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-623 158

WYLE LABS INC HUNTSVILLE ALA RESEARCH STAFF

BASIC MECHANISMS OF NOISE GENERATION BY HELICOPTERS,  
V/STOL AIRCRAFT, AND GROUND EFFECT MACHINES. (U)

MAY 65 39P LOWSON, M. V. 1  
REPT. NO. WR-65-9

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*NOISE, AIRCRAFT), (\*HELICOPTERS,  
NOISE), (\*SHORT TAKE-OFF PLANES, NOISE),  
(\*GROUND EFFECT MACHINES, NOISE), VERTICAL TAKE-OFF  
PLANES, ACCELERATION, STRESSES,  
FORCE(MECHANICS), SOURCES, AIRPLANE NOISE,  
ENGINE NOISE (U)

THE BASIC MECHANISMS OF NOISE GENERATION DUE TO  
MASS INTRODUCTION, APPLIED FORCE AND APPLIED STRESS  
ARE DISCUSSED WITH REFERENCE TO THEIR IMPLICATIONS  
FOR HELICOPTERS, V/STOL AIRCRAFT, AND GROUND  
EFFECT MACHINES. THE SIGNIFICANCE OF THE  
DIMENSIONAL DEPENDENCE OF MONOPOLE, DIPOLE AND  
QUADRUPOLE FIELDS IS SHOWN. THE RESULTS OF A NEW  
THEORY GIVING THE EFFECTS OF SYSTEM ACCELERATIONS ON  
NOISE ARE PRESENTED. THIS THEORY WILL OFTEN HAVE  
APPLICATION TO NOISE PROBLEMS FOR THESE MACHINES  
BECAUSE OF THE CENTRIFUGAL ACCELERATIONS ASSOCIATED  
WITH MANY OF THE NOISE GENERATING COMPONENTS.  
SYSTEM ACCELERATIONS GIVE RISE TO HIGHER ORDER  
POLES IN THE SOUND FIELD WHICH BECOME PARTICULARLY  
IMPORTANT AT HIGH SPEEDS. AN EXPRESSION FOR THE  
SOUND FIELD PRODUCED BY FLUCTUATING LIFT AND DRAG  
FORCES IN A ROTATING AND CONVECTED SYSTEM IS GIVEN.  
AS A FURTHER EXAMPLE OF THE APPLICATION OF THE  
GENERAL THEORY THE SOUND FIELD RADIATED BY A HOVERING  
HELICOPTER IS ANALYZED. IT IS SHOWN HOW A  
PREVIOUSLY UNRECOGNIZED SOURCE OF SOUND ARISES FROM  
THE OUTWARD COMPONENTS OF FORCE INDUCED BY THE  
EFFECTS OF BLADE CONING ANGLE AND LAG. THE SOURCE  
OF SOUND HAS ITS MAXIMUM IN THE PLANE OF THE ROTOR  
DISC. THE IMPORTANCE OF INCLUDING THE PROPER  
MOMENTUM TERMS IN CALCULATIONS OF NOISE RADIATED BY  
MOVING MASS SOURCES IS DEMONSTRATED. (AUTHOR) (U)

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/ZOM08

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-625 599 1/2 1/3  
SYSTEMS TECHNOLOGY INC HAWTHORNE CALIF

AN ANALYTICAL STUDY OF V/STOL HANDLING QUALITIES IN  
HOVER AND TRANSITION. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
OCT 65 172P STAPLEFORD, R. L. IWOLKOVITCH, J.  
MAGDALENO, R. E. SHORTWELL, C. P. JOHNSON, W. A. :

REPT. NO. TR-140-1  
CONTRACT: AF33(615)-1300  
PROJ: AF-8219  
TASK: 821909  
MONITOR: AFFDL , TR-65-73

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (•CONVERTIBLE PLANES, HANDLING),  
(•SHORT TAKE-OFF PLANES, HANDLING), (•VERTICAL  
TAKE-OFF PLANES, HANDLING), GUSTS, HOVERING,  
PILOTS, CONTROL, DAMPING, HELICOPTERS, TILT  
WINGS, GEOMETRIC FORMS (U)

THE HOVER ANALYSIS CONSIDERS PILOT ATTITUDE AND  
POSITION CONTROL TASKS IN THE PRESENCE OF HORIZONTAL  
GUSTS. THE EFFECTS OF EACH OF THE STABILITY  
DERIVATIVES ON THE DIFFICULTY OF THE CONTROL TASKS  
AND ON THE CLOSED-LOOP GUST RESPONSES ARE DETERMINED.  
IT IS CLEARLY SHOWN THAT THE HANDLING QUALITIES  
STUDIES OF CONTROL SENSITIVITY AND ANGULAR DAMPING  
MUST CONSIDER THE INFLUENCES OF  $M_{SUB U}$  (OR  $L_{SUB V}$ ) AND SHOULD INCLUDE GUST INPUTS. THESE  
CONCLUSIONS ARE SUBSTANTIATED BY PREVIOUS VARIABLE-  
STABILITY-HELICOPTER EXPERIMENTS. THE EFFECTS OF  
VEHICLE SIZE AND GEOMETRY ARE INVESTIGATED BY SEVERAL  
APPROACHES. THE KEY RESULT OF INCREASING SIZE IS  
FOUND TO BE A REDUCTION IN  $M_{SUB U}$  AND  $L_{SUB V}$   
WHICH CAN, IN TURN, LOWER THE REQUIREMENTS FOR  
CONTROL POWER AND DAMPING. THE HANDLING QUALITIES  
DURING TRANSITION OF TWO VEHICLES, A TILT DUCT AND A  
TILT WING, WHICH WERE PREVIOUSLY TESTED ON A  
SIMULATOR ARE ANALYZED. IT IS SHOWN THAT BOTH TRIM  
CONTROL AND PERTURBATIONS ABOUT THE TRIM CONDITIONS  
MUST BE CONSIDERED. IN FACT, PART OF THE INCREASED  
DIFFICULTY IN LANDING TRANSITIONS, IN COMPARISON WITH  
TAKEOFF TRANSITIONS, IS DUE TO MORE DIFFICULT TRIM  
CONTROL. THE MUCH MORE STRINGENT POSITION CONTROL  
REQUIREMENTS IN LANDING ARE ALSO A CONTRIBUTING  
FACTOR. (AUTHOR)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-625 722 1/2 1/3  
NAVAL AIR TEST CENTER PATUXENT RIVER MD

FLIGHT TEST EVALUATION OF THE UF-XS JAPANESE STOL  
SEAPLANE. (U)

DESCRIPTIVE NOTE: FINAL TECHNICAL REPT.,  
AUG 64 59P VAGIANOS, NICHOLAS J. IRONEY,  
EUGENE C. I  
REPT. NO. FT2121-031R-64  
TASK: RA1200005/201-1/WS417A0-0

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*SHORT TAKE-OFF PLANES, FLIGHT  
TESTING), (\*SEAPLANES, FLIGHT TESTING), JAPAN,  
HYDRODYNAMIC CHARACTERISTICS, STABILITY,  
PITCH(MOTION), TAKE-OFF, LANDINGS (U)  
IDENTIFIERS: U-16 AIRCRAFT, EVALUATION (U)

THE UF-XS JAPANESE STOL SEAPLANE WAS  
EVALUATED TO DETERMINE THE FLYING QUALITIES IN  
CONFIGURATIONS PA, L, AND TO AT APPROACH SPEEDS  
IN THE VICINITY OF 55 KT AND THE HYDRODYNAMIC  
CHARACTERISTICS WHILE ON THE WATER. THE NASA AMES  
SIMULATOR SHOWED GOOD CORRELATION WITH THE AIRPLANE'S  
AERODYNAMIC CHARACTERISTICS. THE AIRPLANE HAS  
NEUTRAL TO UNSTABLE STATIC LONGITUDINAL STABILITY,  
WEAK DIRECTIONAL STABILITY, LARGE ADVERSE YAW, A LONG  
PERIOD MODERATELY DAMPED DUTCH ROLL MODE, A  
DIVERGENT SPIRAL MODE, AND TRIMS FOR FLIGHT IN A 13  
DEGREE LEFT SIDESLIP. AN AUTOMATIC STABILIZATION  
EQUIPMENT (ASE) MAKES THE STATIC LONGITUDINAL  
STABILITY AND SPIRAL MODES POSITIVE BUT DOES NOT  
IMPROVE THE REMAINING ITEMS. TAKE-OFF AND LANDING  
TOUCHDOWN SPEED IS 50 KT. THE AIRPLANE HAS A  
HYDRODYNAMIC STABLE ELEVATOR RANGE OF 20 TO 35  
DEGREES UP ELEVATOR. A 'DIGGING IN' AND SLIGHT  
'PORPOISING' TENDENCY IS EXHIBITED AT ELEVATOR  
POSITIONS LESS THAN 20 DEGREES. THE AIRPLANE  
POSSESSES GOOD SPRAY CHARACTERISTICS. THE MISSION  
CAPABILITY OF A STOL SEAPLANE SHOULD GREATLY  
IMPROVE WITH REDUCTION IN TAKEOFF AND LANDING SPEED,  
HOWEVER, EVALUATION OF THE AIRPLANE AT LOWER SPEEDS  
WAS NOT POSSIBLE DUE TO SEVERAL AIRPLANE LIMITATIONS.  
(AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-626 360 1/3  
AMERICAN HELICOPTER SOCIETY NEW YORK

PROCEEDINGS OF NATIONAL V/STOL AIRCRAFT SYMPOSIUM  
(1ST), 3-4 NOVEMBER 1965, WRIGHTPATTERSON AFB, OHIO. (U)

65 375P

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*VERTICAL TAKE-OFF PLANES, SYMPOSIA),  
(\*SHORT TAKE-OFF PLANES, SYMPOSIA), DESIGN,  
FLIGHT TESTING, OPERATION,  
PROPELLERS(AERIAL), PROPULSION, ATTITUDE  
CONTROL SYSTEMS, HOVERING, TILT WINGS (U)

THE TECHNICAL PAPERS PRESENTED ARE GROUPED INTO THE  
FOLLOWING THREE CATEGORIES: (1) V/STOL AIRCRAFT  
DESIGN, (2) V/STOL SUBSYSTEM DESIGN, AND (3)  
V/STOL AIRCRAFT TESTING AND OPERATION. (AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM08

AD-629 632 1/1 1/3  
ARMY AVIATION MATERIEL LABS FORT EUSTIS VA

OV-1A MOHAWK FLIGHT LOADS INVESTIGATION PROGRAM. (U)

DESCRIPTIVE NOTE: ENGINEERING LAB. REPT.,  
JAN 66 57P CHESTNUTT, DAVID I  
REPT. NO. USAAVLABS-TR-66-6,  
PROJ: DA-1P125901A142  
TASK: 1P125901A14229

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (SHORT TAKE-OFF PLANES, FLIGHT),  
LOADING(MECHANICS), EXPERIMENTAL DATA,  
MANEUVERABILITY, DESIGN, ACCELERATION, AIRSPEED,  
ALTITUDE, WEIGHT  
IDENTIFIERS: V-1 AIRCRAFT (U)  
(U)

A PRIMARY OBJECTIVE OF THIS EFFORT WAS TO PROVIDE  
OPERATIONAL DATA FOR ESTABLISHING FUTURE SHORT  
TAKEOFF AND LANDING (STOL) AIRCRAFT DESIGN  
CRITERIA. TO ACCOMPLISH THIS END, TWO OV-1A  
AIRCRAFT WERE SELECTED THAT WERE PARTICIPATING IN  
AIR-ASSAULT MANEUVERS. APPROXIMATELY 200 HOURS OF  
FLIGHT DATA WERE RECORDED WITHIN APPROXIMATELY 10  
WEEKS. THE PARAMETERS RECORDED WERE: AIRSPEED,  
ALTITUDE, OUTSIDE AIR TEMPERATURE, AND ACCELERATION  
AT THE AIRCRAFT CENTER OF GRAVITY. IN ADDITION,  
SUPPLEMENTARY DATA WERE COLLECTED ON THE TYPE OF  
MISSION AND GROSS WEIGHT OF THE AIRCRAFT. THESE  
DATA ARE PRESENTED AS SEVERAL FREQUENCY-OF-OCCURRENCE  
FORMS, EXCEEDANCE CURVES, AND GUST SPECTRA.  
(AUTHOR)

(U)

UNCLASSIFIED

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOR

AD-629 637 1/1

DYNASCIENCES CORP FORT WASHINGTON PA

AN INVESTIGATION OF PROPELLER SLIPSTREAM EFFECTS ON  
V/STOL AIRCRAFT PERFORMANCE AND STABILITY. (U)

DESCRIPTIVE NOTE: REPT. FOR APR 64-MAR 65,  
FEB 66 145P BUTLER, L. HUANG, K. P. I  
GOLAND, L. I

REPT. NO. DCR-174,  
CONTRACT: DA-44-177-AMC-48(T),  
TASK: 1D121401A14203,  
MONITOR: USAAVLABS , TR-65-81

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (•SHORT TAKE-OFF PLANES,  
PERFORMANCE(ENGINEERING)), (•VERTICAL TAKE-OFF  
PLANES, PERFORMANCE(ENGINEERING)),  
(•PROPELLERS(AERIAL), STABILITY), STALLING,  
WINGS, PITCH(MOTION), ANALOG COMPUTERS (U)  
IDENTIFIERS: SLIPSTREAM (U)

SPECIFIC AREAS INVESTIGATED INCLUDE WING STALL  
DURING TRANSITION, MINIMUM WING SIZE FOR STALL-FREE  
TRANSITION, AND THE EFFECTS OF SLIPSTREAM ON AIRCRAFT  
PITCHING MOMENTS. IN ADDITION, A STABILITY  
ANALYSIS WAS PERFORMED, AND ANALOG COMPUTER  
TECHNIQUES WERE USED TO DETERMINE THE FEASIBILITY OF  
UTILIZING THE SLIPSTREAM FOR STABILITY AUGMENTATION.  
FINALLY, THE EFFECTS OF THE NONUNIFORMITY OF  
SLIPSTREAM VELOCITY AND WING GEOMETRY MODIFICATIONS  
ON PERFORMANCE WERE ANALYZED. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-629 647 1/1  
BOEING CO MORTON PA VERTOL DIV

INVESTIGATION OF AN ISOLATED MONOCYCLIC V/STOL  
PROPELLER PERFORMANCE AND OSCILLATORY STRESS.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
FEB 66 122P DE DECKER, R. W. I  
REPT. NO. R-432,  
CONTRACT: DA-44-177-AMC-319(T),  
PROJ: DA-1P121401A141  
TASK: 1P121401A14178,  
MONITOR: USAAVLABS , TR-65-80

UNCLASSIFIED REPORT

DESCRIPTORS: (\*PROPELLERS(AERIAL),  
PERFORMANCE(ENGINEERING)), (\*VERTICAL TAKE-OFF  
PLANES, TESTS), (\*SHORT TAKE-OFF PLANES, TESTS),  
OSCILLATION, STRESSES, PROPELLER BLADES,  
CONTROL, AERODYNAMIC CHARACTERISTICS,  
PITCH(MOTION), STALLING, DRAG

(U)

TEST RESULTS CONFIRMED: (1) THAT THERE IS AN  
APPARENT PHASE SHIFT OF THE MONOCYCLIC AXIS AT HIGH  
COLLECTIVE ANGLE, CAUSED BY HYSTERESIS IN THE  
AIRFOIL'S STALL CHARACTERISTICS, AND (2) THAT  
THERE IS AN INCREASE IN SIDE FORCE AS COLLECTIVE  
ANGLE IS INCREASED, CAUSED BY A NONLINEAR VARIATION  
IN AIRFOIL DRAG WITH CYCLIC PITCH. THE MONOCYCLIC  
PROPELLER TEST PROGRAM ALSO INCLUDED INVESTIGATION OF  
THE EFFECTS OF CONTROL SYSTEM STIFFNESS ON THE  
DYNAMIC RESPONSE OF THE PROPELLER AND CONTROL SYSTEM.  
THE RESULTS INDICATE THAT THE USE OF CYCLIC-BLADE-  
PITCH CONTROL REDUCES THE HARMONIC CONTENT OF CONTROL  
SYSTEM OSCILLATORY LOADS TO BASICALLY A FIRST-  
HARMONIC RESPONSE. HIGHER HARMONIC LOADS ARE  
PRESENT, BUT THEIR AMPLITUDES ARE LESS THAN 10  
PERCENT OF THE RESULTANT PEAK-TO-PEAK LOAD, AND ARE  
THEREFORE CONSIDERED NEGLIGIBLE. THE RESULTS OF  
THE PROGRAM ALSO INDICATE THAT THE INCREASE OF  
CONTROL SYSTEM STIFFNESS RESULTED IN AN INCREASE IN  
BLADE-PITCH-LINK OSCILLATORY LOADS.

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM08

AD-634 548 1/3  
AMERICAN HELICOPTER SOCIETY NEW YORK

PROCEEDINGS OF NATIONAL V/STOL AIRCRAFT SYMPOSIUM  
(1ST), SUPPLEMENT, HELD 3-4 NOVEMBER 1965 AT WRIGHT-  
PATTERSON AFB, OHIO. (U)

NOV 65 143P

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*VERTICAL TAKE-OFF PLANES, SYMPOSIA),  
(\*SHORT TAKE-OFF PLANES, SYMPOSIA), DESIGN,  
FLIGHT TESTING, LIFT, FANS (U)  
IDENTIFIERS: X-22 AIRCRAFT (U)

A DESCRIPTION OF THE X-22A AIRPLANE AND ITS  
SYSTEMS IS GIVEN INCLUDING THE SPECIAL TESTING  
UNDERTAKEN TO PROVE THESE SYSTEMS. TEST PROGRESS  
AND CERTAIN PROBLEM AREAS RELATED TO VTOL DESIGN  
ARE DISCUSSED. TEST PILOT PARTICIPATION IN THE  
PRE-FLIGHT PHASES OF THE PROGRAM AND PILOT  
PREPARATION FOR FIRST FLIGHTS IS DESCRIBED.  
PROGRESS IN GROUND TEST BUILDUP TO FIRST FLIGHT IS  
REPORTED. APPROACH TO FIRST FLIGHT AND DEVELOPMENT  
OF V/STOL PROFILES IS COVERED AND THE DEMONSTRATION  
PROGRAM INCLUDING MILITARY PARTICIPATION IS OUTLINED.  
(AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-634 722 20/4  
DYNASCIENCES CORP FORT WASHINGTON PA

CHARTS FOR ESTIMATING AERODYNAMIC FORCES ON STOL  
AIRCRAFT WINGS IMMERSED IN PROPELLER SLIPSTREAMS. (U)

DESCRIPTIVE NOTE: FINAL REPT.,  
NOV 65 81P HUANG, K. P. IGOLAND, L. IBALIN,  
I. I  
REPT. NO. DCR-161,  
CONTRACT: NOW-64-0316

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (SHORT TAKE-OFF PLANES, AERODYNAMICS),  
(WINGS, AERODYNAMIC CHARACTERISTICS), MATHEMATICAL  
PREDICTION, PROPELLERS(AERIAL):  
FORCE(MECHANICS), LIFT (U)  
IDENTIFIERS: SLIPSTREAM (U)

EQUATIONS AND CHARTS ARE PRESENTED FOR ESTIMATING  
THE LIFT AND LONGITUDINAL FORCE COEFFICIENTS OF  
STOL AIRCRAFT WINGS IMMERSED IN PROPELLER  
SLIPSTREAMS. SAMPLE CALCULATIONS ARE MADE AND THE  
RESULTS SHOW FAIR TO GOOD CORRELATION WITH AVAILABLE  
EXPERIMENTAL DATA. THE EFFECT OF MANY DESIGN AND  
OPERATING PARAMETERS IS ANALYZED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-637 133 1/2  
AVIATION SAFETY ENGINEERING AND RESEARCH PHOENIX ARIZ

PRINCIPLES FOR IMPROVING STRUCTURAL CRASHWORTHINESS  
FOR STOL AND CTOL AIRCRAFT. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.  
JUN 66 73P REED, WILLIAM H. I AVERY, JAMES  
P. 1  
REPT. NO. AVSER-45-18,  
CONTRACT: DA-44-177-AMC-254(T),  
TASK: IP125901A14230,  
MONITOR: USAAVLABS TR-66-39

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (•AVIATION ACCIDENTS, •SHORT TAKE-OFF  
PLANES), AIRFRAMES, LOADING(MECHANICS), IMPACT  
SHOCK, DEFORMATION, AVIATION SAFETY, ACCELERATION,  
CRASH INJURIES, DESIGN (U)  
IDENTIFIERS: CRASHWORTHINESS (U)

THE AREA OF CRASH BEHAVIOR ANALYSIS OF AIRCRAFT  
STRUCTURES IS INVESTIGATED. THE INVESTIGATION  
BEGINS WITH THE DEFINITION OF TWO INDICES OF  
CRASHWORTHINESS OF BASIC AIRCRAFT STRUCTURES AND THE  
ANALYSIS OF THE INFLUENCE OF SEVERAL GENERAL TYPES OF  
STRUCTURAL MODIFICATIONS UPON THESE TWO INDICES.  
THIS ANALYSIS, USING FUNDAMENTAL PRINCIPLES OF  
MECHANICS, CONTAINS SEVERAL SIMPLIFYING ASSUMPTIONS,  
WHICH ARE EXPLAINED AS THEY ARE INTRODUCED. DESIGN  
CONCEPTS TO IMPROVE THE ABILITY OF THE PROTECTIVE  
CONTAINER TO MAINTAIN LIVING SPACE FOR OCCUPANTS  
DURING A CRASH OR TO ATTENUATE THE ACCELERATIONS  
EXPERIENCED BY OCCUPANTS DURING A CRASH ARE DEVELOPED  
FOR CRASH CONDITIONS WHICH ARE EITHER PRIMARILY  
LONGITUDINAL IN NATURE OR PRIMARILY VERTICAL IN  
NATURE. ANALYTICAL METHODS ARE THEN PROVIDED TO  
SHOW HOW AND WHEN TO APPLY THESE DESIGN CONCEPTS TO  
ANY PARTICULAR AIRCRAFT. THE PRINCIPLES WHICH ARE  
PRESENTED ARE SUITABLE FOR USE DURING DESIGN OF NEW  
AIRCRAFT AS WELL AS MODIFICATION OF EXISTING  
AIRCRAFT. THE RESULTS ARE PRESENTED FROM THREE  
FULL-SCALE CRASH TESTS OF SMALL TWIN-ENGINE AIRPLANES  
WHICH WERE CONDUCTED AS A PART OF THIS INVESTIGATION.  
(AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-641 506 15/5 5/3  
MCCONNELL AIRCRAFT CORP ST LOUIS MO

TECHNICAL AND ECONOMIC EVALUATION OF AIRCRAFT FOR  
INTERCITY SHORT-HAUL TRANSPORTATION. VOLUME I. (U)

DESCRIPTIVE NOTE: FINAL REPT.

APR 66 47P

CONTRACT: FA-65-WA-1246

MONITOR: FAA-ADS 74-VOL-1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE AD-641 507 AND AD-641-508.

DESCRIPTORS: (\*AIR TRANSPORTATION, \*ECONOMICS),  
(\*SHORT TAKE-OFF PLANES, ECONOMICS), (\*VERTICAL  
TAKE-OFF PLANES, ECONOMICS), COMMERCIAL PLANES,  
COSTS, AIRPORTS, AIR TRAFFIC, CALIFORNIA,  
SIMULATION, OPERATION (U)

THIS REPORT EVALUATES THE POTENTIAL AIRLINE USE OF  
STOL/VTOL AIRCRAFT TO SERVE INTERCITY SHORT HAUL  
TRAVELERS. THE AIR TRAVEL MARKET IN THE  
CALIFORNIA CORRIDOR (BETWEEN LOS ANGELES  
AND SAN DIEGO ON THE SOUTH AND SACRAMENTO AND  
SAN FRANCISCO ON THE NORTH) WAS USED FOR THE  
STUDY BUT THE RESULTS WOULD BE GENERALLY APPLICABLE  
TO OTHER AREAS. BASED ON 1970 TECHNOLOGY, FOUR  
STOL AND VTOL AIRCRAFT CONFIGURATIONS WERE  
DESIGNED AS 60-, 90-, AND 120-PASSENGER TRANSPORTS,  
AND DEVELOPED FOR LOWEST OPERATING COSTS FOR A 500-  
MILE STAGE LENGTH. A CONVENTIONAL JET TRANSPORT  
WAS USED AS A BASE OF REFERENCE AND A CONVENTIONAL  
HELICOPTER WAS INCLUDED FOR COMPARISON. THE  
SPECIAL STOL/VTOL AIRPORTS WERE LOCATED FOR  
PASSENGER CONVENIENCE AND ACCEPTABLE NOISE LEVELS FOR  
THE SURROUNDING AREAS. TO EVALUATE STOL/VTOL  
ECONOMIC VIABILITY, STOL AND VTOL AIRLINE  
SERVICE WAS SIMULATED IN THE CALIFORNIA CORRIDOR  
IN 1975 AND 1980, AND THEN COMPARED WITH THE  
CONVENTIONAL JET SIMULATION IN THOSE YEARS. IT WAS  
FOUND THAT THE TIME SAVINGS AND CONVENIENCE PROVIDED  
BY EITHER STOL OR VTOL AIRLINE SERVICE WOULD  
ENABLE STOL OR VTOL TO CAPTURE A SUBSTANTIAL  
SHARE OF THE SHORT-HAUL AIR TRAVEL MARKET WHEN  
COMBINED IN A SYSTEM WITH CONVENTIONAL JETS, AND  
WOULD INDUCE ADDITIONAL AIR TRAVEL. THIS SYSTEM  
WOULD GIVE A SATISFACTORY RETURN ON INVESTMENT. THE  
REPORT IS IN THREE VOLUMES. VOLUME I IS AN  
EXECUTIVE SUMMARY CONTAINING INTRODUCTION,  
CONCLUSIONS, AND THE SUMMARY OF METHOD AND RESULTS. (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-641 507 15/5 5/3  
MCDONNELL AIRCRAFT CORP ST LOUIS MO

TECHNICAL AND ECONOMIC EVALUATION OF AIRCRAFT FOR  
INTERCITY SHORT-HAUL TRANSPORTATION. VOLUME II. (U)

DESCRIPTIVE NOTE: FINAL REPT.

APR 66 190P

CONTRACT: FA-63-WA-1246

MONITOR: FAA-ADS 74-VOL-2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-641 506 AND AD-641  
508.

DESCRIPTORS: (\*AIR TRANSPORTATION; \*ECONOMICS),  
(\*SHORT TAKE-OFF PLANES; ECONOMICS), (\*VERTICAL  
TAKE-OFF PLANES; ECONOMICS), COMMERCIAL PLANES,  
COSTS, AIRPORTS, AIR TRAFFIC, CALIFORNIA,  
SIMULATION, AIRPLANE NOISE, OPERATION (U)

THIS REPORT EVALUATES THE POTENTIAL AIRLINE USE OF  
STOL/VTOL AIRCRAFT TO SERVE INTERCITY SHORT HAUL  
TRAVELERS. THE AIR TRAVEL MARKET IN THE  
CALIFORNIA CORRIDOR (BETWEEN LOS ANGELES  
AND SAN DIEGO ON THE SOUTH AND SACRAMENTO AND  
SAN FRANCISCO ON THE NORTH) WAS USED FOR THE  
STUDY BUT THE RESULTS WOULD BE GENERALLY APPLICABLE  
TO OTHER AREAS. BASED ON 1970 TECHNOLOGY, FOUR  
STOL AND VTOL AIRCRAFT CONFIGURATIONS WERE  
DESIGNED AS 60-, 90-, AND 120-PASSENGER TRANSPORTS,  
AND DEVELOPED FOR LOWEST OPERATING COSTS FOR A 500-  
MILE STAGE LENGTH. A CONVENTIONAL JET TRANSPORT  
WAS USED AS A BASE OF REFERENCE AND A CONVENTIONAL  
HELICOPTER WAS INCLUDED FOR COMPARISON. THE  
SPECIAL STOL/VTOL AIRPORTS WERE LOCATED FOR  
PASSENGER CONVENIENCE AND ACCEPTABLE NOISE LEVELS FOR  
THE SURROUNDING AREAS. TO EVALUATE STOL/VTOL  
ECONOMIC VIABILITY, STOL AND VTOL AIRLINE  
SERVICE WAS SIMULATED IN THE CALIFORNIA CORRIDOR  
IN 1975 AND 1980, AND THEN COMPARED WITH THE  
CONVENTIONAL JET SIMULATION IN THOSE YEARS. IT WAS  
FOUND THAT THE TIME SAVINGS AND CONVENIENCE PROVIDED  
BY EITHER STOL OR VTOL AIRLINE SERVICE WOULD  
ENABLE STOL OR VTOL TO CAPTURE A SUBSTANTIAL  
SHARE OF THE SHORT-HAUL AIR TRAVEL MARKET WHEN  
COMBINED IN A SYSTEM WITH CONVENTIONAL JETS, AND  
WOULD INDUCE ADDITIONAL AIR TRAVEL. THIS SYSTEM  
WOULD GIVE A SATISFACTORY RETURN ON INVESTMENT.  
THE REPORT IS IN THREE VOLUMES. VOLUME I IS AN  
EXECUTIVE SUMMARY CONTAINING INTRODUCTION,

53

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-641 508 15/5 5/3  
MCDONNELL AIRCRAFT CORP ST LOUIS MO

TECHNICAL AND ECONOMIC EVALUATION OF AIRCRAFT FOR  
INTERCITY SHORT-HAUL TRANSPORTATION, VOLUME III. (U)

DESCRIPTIVE NOTE: FINAL REPT.

APR 66 178P  
CONTRACT: FA-65-WA-1246  
MONITOR: FAA-ADS 74-VOL-3

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-641 507 AND AD-641  
506.

DESCRIPTORS: (•AIR TRANSPORTATION, •ECONOMICS),  
(•SHORT TAKE-OFF PLANES, ECONOMICS), (•VERTICAL  
TAKE-OFF PLANES, ECONOMICS), COMMERCIAL PLANES,  
COSTS, AIRPORTS, AIR TRAFFIC, CALIFORNIA,  
SIMULATION, OPERATION, AIRPLANE NOISE (U)

THIS REPORT EVALUATES THE POTENTIAL AIRLINE USE OF  
STOL/VTOL AIRCRAFT TO SERVE INTERCITY SHORT HAUL  
TRAVELERS. THE AIR TRAVEL MARKET IN THE  
CALIFORNIA CORRIDOR (BETWEEN LOS ANGELES  
AND SAN DIEGO ON THE SOUTH AND SACRAMENTO AND  
SAN FRANCISCO ON THE NORTH) WAS USED FOR THE  
STUDY BUT THE RESULTS WOULD BE GENERALLY APPLICABLE  
TO OTHER AREAS. BASED ON 1970 TECHNOLOGY, FOUR  
STOL AND VTOL AIRCRAFT CONFIGURATIONS WERE  
DESIGNED AS 60-, 90-, AND 120-PASSENGER TRANSPORTS,  
AND DEVELOPED FOR LOWEST OPERATING COSTS FOR A 500-  
MILE STAGE LENGTH. A CONVENTIONAL JET TRANSPORT  
WAS USED AS A BASE OF REFERENCE AND A CONVENTIONAL  
HELICOPTER WAS INCLUDED FOR COMPARISON. THE  
SPECIAL STOL/VTOL AIRPORTS WERE LOCATED FOR  
PASSENGER CONVENIENCE AND ACCEPTABLE NOISE LEVELS FOR  
THE SURROUNDING AREAS. TO EVALUATE STOL/VTOL  
ECONOMIC VIABILITY, STOL AND VTOL AIRLINE SERVICE  
WAS SIMULATED IN THE CALIFORNIA CORRIDOR IN 1975  
AND 1980, AND THEN COMPARED WITH THE CONVENTIONAL JET  
SIMULATION IN THOSE YEARS. IT WAS FOUND THAT THE  
TIME SAVINGS AND CONVENIENCE PROVIDED BY EITHER  
STOL OR VTOL AIRLINE SERVICE WOULD ENABLE STOL  
OR VTOL TO CAPTURE A SUBSTANTIAL SHARE OF THE  
SHORT-HAUL AIR TRAVEL MARKET WHEN COMBINED IN A  
SYSTEM WITH CONVENTIONAL JETS, AND WOULD INDUCE  
ADDITIONAL AIR TRAVEL. THIS SYSTEM WOULD GIVE A  
SATISFACTORY RETURN ON INVESTMENT.

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOA

AJ-645 883 14/2 1/3  
PRINCETON UNIV N J DEPT OF AEROSPACE AND MECHANICAL  
SCIENCES

GENERAL DESCRIPTION OF THE PRINCETON DYNAMIC MODEL  
TRACK, (U)

NOV 66 31P CURTISS, H. C. PUTMAN, W. F. I  
TRAYBAR, J. J. I  
REPT. NO. 738  
CONTRACT: DA-44-177-AMC-8(T)  
TASK: 1P1259U1A14233  
MONITOR: USAAVLABS TR-66-73

UNCLASSIFIED REPORT

DESCRIPTORS: (TRACKS(AERODYNAMICS), SHORT TAKE-  
OFF PLANES), DESIGN, HYDRAULIC SYSTEMS, AIRPLANE  
MODELS, AERODYNAMIC CHARACTERISTICS, VELOCITY,  
MODEL TESTS (U)

THE PRINCETON DYNAMIC MODEL TRACK IS A  
FACILITY WHICH CONSISTS OF A SERVOCONTROLLED  
HYDRAULICALLY POWERED MODEL CARRIAGE MOUNTED ON A  
MONORAIL TRACK. THE TRACK IS HOUSED INSIDE A 30-  
BY-30-FOOT BUILDING 750 FEET LONG. THE CARRIAGE  
CONTAINS A MODEL MOUNT DESIGNED TO ALLOW THE CARRIAGE  
TO FOLLOW THE POWERED MODEL WITHOUT IMPOSING  
RESTRAINTS ON THE MODEL MOTIONS BEING STUDIED.  
FROM ONE TO FIVE DEGREES OF FREEDOM MOTIONS CAN BE  
EXAMINED, BOTH LONGITUDINAL AND LATERAL-DIRECTIONAL,  
IN OR OUT OF GROUND EFFECT. THE DYNAMIC MODEL  
TRACK CAN PROVIDE STATIC AND DYNAMIC DERIVATIVE  
DATA (E.G., VELOCITY AND RATE-DEPENDENT AERODYNAMIC  
STABILITY AND CONTROL DERIVATIVES) ON V/STOL  
AIRCRAFT MODELS OR COMPONENTS IN AND NEAR HOVER,  
SLOW SPEED FLIGHT, AND DURING TRANSITION. IN  
ADDITION, IT CAN PROVIDE AN EXPERIMENTAL SIMULATION  
OF THE EXPECTED FULL-SCALE VEHICLE CONTROL-FIXED  
DYNAMIC MOTIONS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOR

AD-652 926 1/3  
ADVISORY GROUP FOR AERONAUTICAL RESEARCH AND DEVELOPMENT  
PARIS (FRANCE)

FLIGHT TEST INSTRUMENTATION FOR V/STOL AIRCRAFT. (U)

APR 61 66P BRUNING, G. I  
REPT. NO. AGARD-317

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: NATO FURNISHED.

DESCRIPTORS: (\*SHORT TAKE-OFF PLANES, FLIGHT TESTING), (\*VERTICAL TAKE-OFF PLANES, FLIGHT TESTING), (\*FLIGHT TESTING, INSTRUMENTATION), OPTIMIZATION, TEST METHODS, AIRBORNE, RECORDING SYSTEMS, TEST EQUIPMENT, FRANCE (U)

THE FLIGHT TESTING OF V/STOL AIRCRAFT INVOLVES THE MEASUREMENT OF CERTAIN QUANTITIES, SOME OF WHICH ARE THE SAME AS FOR CONVENTIONAL AIRCRAFT. WHERE THE QUANTITIES ARE DIFFERENT, THOSE CONCERNED IN THE V/STOL FIELD HAVE TACKLED THE NEW PROBLEMS IN THEIR OWN WAY. GENERAL ASPECTS ARE CONSIDERED, SOME ILLUSTRATIVE EXAMPLES ARE GIVEN, THE PHYSICAL QUANTITIES OF INTEREST IN V/STOL TESTING ARE DISCUSSED, AND RECORDING METHODS ARE DESCRIBED. FINALLY, AN ATTEMPT IS MADE TO SUGGEST AN OPTIMUM INSTRUMENTATION. IT IS CONCLUDED THAT MOST OF THE QUANTITIES OF INTEREST CAN BE MEASURED BY CONVENTIONAL METHODS, WHEREAS OTHERS, SUCH AS LOW HORIZONTAL SPEEDS, ALTITUDE, AND RATE OF CLIMB AND DESCENT, PRESENT DIFFICULTIES. THERE IS AN OBVIOUS DEMAND FOR LIGHTER AIRBORNE EQUIPMENT THAN IS AVAILABLE AT PRESENT. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM04

AD-652 998 1/3 1/1  
ADVISORY GROUP FOR AERONAUTICAL RESEARCH AND DEVELOPMENT  
PARIS (FRANCE)

METHODS UTILISEES POUR LA MISE AU POINT DE L'AVION  
BREGUET 940 A AILES SOUFFLEES (METHODS USED FOR THE  
FINAL DESIGN ANALYSIS OF THE BREGUET 940 'BLOWER-  
WING' PLANE), (U)

APR 61 25P DERICHEMONT, G. I  
REPT. NO. AGARD-371

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: NATO FURNISHED. TEXT IN FRENCH;  
DISCUSSION PARTLY IN ENGLISH; ADDENDUM IN ENGLISH.

DESCRIPTORS: (\*SHORT TAKE-OFF PLANES, DESIGN),  
AERODYNAMIC CHARACTERISTICS, MODEL TESTS, WIND  
TUNNEL MODELS, FLIGHT TESTING, FLIGHT SIMULATORS,  
TRANSPORT PLANES, FRANCE (U)  
IDENTIFIERS: BREGUET 940 (U)

MANY COORDINATED METHODS WERE UTILIZED IN THE STUDY  
OF THE DYNAMIC CHARACTERISTICS OF THE AIRCRAFT  
BREGUET 940. METHODS OF STUDY INCLUDED  
UTILIZATION OF A FIXED MODEL IN A WIND TUNNEL, A  
MOTORIZED FLYING MODEL, AN ELECTRONIC FLIGHT  
SIMULATOR, AND OBSERVATIONS OF THE AIRCRAFT ITSELF IN  
FLIGHT. (U)



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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-654 469 1/3 1/1  
MISSISSIPPI STATE UNIV STATE COLLEGE DEPT OF  
AEROPHYSICS

XV-11A DESCRIPTION AND PRELIMINARY FLIGHT TEST. (U)

DESCRIPTIVE NOTE: RESEARCH REPT.,  
MAY 67 106P ROBERTS, SEAN C. ; STEWART,  
ABERDEEN W. ; BOAZ, VIRGIL L. ; BRYANT, GLENN  
D. ; MERTAUGH, LAWRENCE J. , JR;  
REPT. NO. AEROPHYSICS-RR-75  
CONTRACT: DA-44-177-AMC-266(T)  
PROJ: DA-1F125901A142  
TASK: 1F125901A14203  
MONITOR: USAAVLABS TR-67-21

UNCLASSIFIED REPORT

DESCRIPTORS: (•SHORT TAKE-OFF PLANES, FLIGHT  
TESTING), GLASS TEXTILES, POLYESTER PLASTICS,  
REINFORCING MATERIALS, LIFT, CAMBER, BOUNDARY  
LAYER CONTROL, SHROUDED PROPELLERS, AERODYNAMIC  
CHARACTERISTICS

IDENTIFIERS: V-11 AIRCRAFT

(U)

(U)

THE XV-11A IS A POLYESTER REINFORCED FIBER  
GLASS STOL AIRCRAFT. THIS FOUR-PLACE AIRCRAFT,  
POWERED BY A 250-HORSEPOWER T-63 TURBINE ENGINE,  
WAS DESIGNED TO ACHIEVE HIGH-LIFT COEFFICIENTS BY  
MEANS OF A VARIABLE CAMBER WING WITH DISTRIBUTED  
SUCTION BOUNDARY LAYER CONTROL. A SHROUDED  
PROPELLER WAS USED FOR THRUST AUGMENTATION AT LOW  
FORWARD VELOCITIES, AND BETA CONTROL ON THE PROPELLER  
WAS SUCCESSFULLY USED AS A DRAG INCREMENT FOR GLIDE  
PATH CONTROL. TO DATE, THE XV-11A AIRCRAFT HAS  
FLOWN 49 FLIGHTS WITH A TOTAL FLIGHT TIME OF 35  
HOURS. THE MAJORITY OF THE FLIGHT TIME WAS  
INVOLVED IN AERODYNAMIC RESEARCH OF THE SHROUDED  
PROPELLER, THE DISTRIBUTED SUCTION BOUNDARY LAYER  
CONTROL SYSTEM AND IN AN EVALUATION OF THE GENERAL  
HANDLING CHARACTERISTICS OF THE AIRCRAFT. A  
MINIMUM OF PERFORMANCE DATA WAS COLLECTED SINCE THE  
PRIMARY OBJECTIVE WAS AERODYNAMIC RESEARCH. THE  
FIBER GLASS MATERIAL DEMONSTRATED THE EXCELLENT  
POSSIBILITIES OF THIS TYPE OF CONSTRUCTION WHEN  
COMPLEX, AERODYNAMICALLY SMOOTH CURVATURES ARE  
DESIRED. (AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOA

AD-656 810 14/2 20/4 1/1  
WASHINGTON UNIV SEATTLE

LIMITS ON MINIMUM-SPEED V/STOL WIND-TUNNEL  
TESTS.

(U)

DESCRIPTIVE NOTE: REVISED ED.,

JAN 67 10<sup>5</sup> RAE, WILLIAM H. , JR.

CONTRACT: DA-ARO(D)-31-124-G481

PROJ: AROD-4506E, DA-20014501833G

MONITOR: AROD 4506:2-E

UNCLASSIFIED REPORT

AVAILABILITY: PUBLISHED IN JOURNAL OF AIRCRAFT  
V4 N3 P249-54 MAY-JUNE 1967.

SUPPLEMENTARY NOTE: REVISION OF MANUSCRIPT SUBMITTED 30  
SEP 66. PRESENTED AT THE AIAA AERODYNAMIC TESTING  
CONFERENCE, LOS ANGELES, CALIF., 21-23 SEP 66.  
PREPRINT 66-736.

DESCRIPTORS: (•ROTARY WINGS, MODEL TESTS), WIND  
TUNNEL MODELS, SHORT TAKE-OFF PLANES, WIND TUNNELS,  
ACCURACY, SIMULATION, DOWNWASH, GEOMETRIC FORMS,  
JET FLAPS

(U)

THE PAPER PRESENTS THE RESULTS OF A SYSTEMATIC  
SERIES OF WIND-TUNNEL TESTS, WHICH HAVE DETERMINED  
THE MAXIMUM SIZE ROTOR THAT CAN BE TESTED IN CLOSED-  
THROAT WIND TUNNELS BOTH AS A FUNCTION OF THE  
DOWNWASH ANGLE AND AS A FUNCTION OF TUNNEL GEOMETRY.  
FOR A GIVEN SIZE ROTOR AND TUNNEL THERE APPEARS TO  
BE A MAXIMUM VALUE OF DOWNWASH THAT CAN BE TOLERATED.  
IF THIS VALUE OF DOWNWASH IS EXCEEDED, THE FLOW  
THROUGH THE WIND TUNNEL IS NO LONGER SIMILAR TO THE  
FLOW THAT WOULD BE ENCOUNTERED IN FREE FLIGHT BUT  
RATHER REPRESENTS A FLOW SIMILAR TO RECIRCULATION.  
THE POINT AT WHICH THE MAXIMUM DOWNWASH IS REACHED  
IS CALLED THE FLOW BREAKDOWN POINT. SIMILAR  
RESULTS HAVE ALSO BEEN OBTAINED USING JET FLAPS AND  
JET-LIFT MODELS. IT IS ALSO SHOWN THAT THIS FLOW  
BREAKDOWN IS A FUNCTION OF TUNNEL GEOMETRY AND THAT  
THE ALLOWABLE DOWNWASH ANGLES ARE DIFFERENT FOR  
RECTANGULAR TUNNELS WITH WIDTH-TO-HEIGHT RATIOS OF  
W/H = 1.50, 1.00, 0.67, AND 0.50. THE ADDITION  
OF FILLETS TO THE TEST SECTION IS ALSO SHOWN TO HAVE  
AN ADVERSE EFFECT ON THE ALLOWABLE DOWNWASH ANGLE.  
AT THE PRESENT TIME, THE OPTIMUM TUNNEL  
CONFIGURATION FOR ROTORS AND OTHER TYPES OF V/STOL  
VEHICLES IS NOT KNOWN. (AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL No. /ZDM08

AD-657 562 1/3 20/4 1/1  
CORNELL AERONAUTICAL LAB INC BUFFALO N Y

CAL/USAAVLABS SYMPOSIUM PROCEEDINGS. AERODYNAMIC  
PROBLEMS ASSOCIATED WITH V/STOL AIRCRAFT. VOLUME 1.  
PROPELLER AND ROTOR AERODYNAMICS. HELD JUNE 22,  
1966, STATLER-HILTON HOTEL, BUFFALO, NEW YORK. (U)

JUN 66 275P

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME 2, AD-657 563.

DESCRIPTORS: (\*HELICOPTERS; \*AERODYNAMIC  
CHARACTERISTICS), (\*VERTICAL TAKE-OFF PLANES,  
AERODYNAMIC CHARACTERISTICS), (\*SHORT TAKE-OFF  
PLANES, AERODYNAMIC CHARACTERISTICS), SYMPOSIA,  
PROPELLERS(AERIAL); ROTOR BLADES(ROTARY  
WINGS); PERFORMANCE(ENGINEERING); HELICOPTER  
ROTORS; TESTS; STRESSES; PREDICTIONS;  
AERODYNAMIC LOADING; WAKE; VORTICES; THEORY (U)

CONTENTS: A THEORY FOR STATIC PROPELLER  
PERFORMANCE; PROPELLER TESTING AT ZERO VELOCITY;  
PROPELLER RESEARCH AT CANADAIR LIMITED;  
PREDICTION OF THE PERFORMANCE AND STRESS  
CHARACTERISTICS OF VTOL PROPELLERS; PERFORMANCE  
POTENTIAL OF ROTOR BLADE INBOARD AERODYNAMIC DEVICES;  
AERODYNAMIC LOADING OF HIGH-SPEED ROTORS;  
PREDICTION OF ROTOR WAKE FLOWS; THE MOVEMENT,  
STRUCTURE AND BREAKDOWN OF TRAILING VORTICES FROM A  
ROTOR BLADE. (U)

UNCLASSIFIED

ODC REPORT BIBLIOGRAPHY RESEARCH CONTROL NO. /ZOM06

AD-657 563 1/3 20/4 1/1  
CORNELL AERONAUTICAL LAB INC BUFFALO N Y

CAL/USAAVLAYS SYMPOSIUM PROCEEDINGS. AERODYNAMIC  
PROBLEMS ASSOCIATED WITH V/STOL AIRCRAFT. VOLUME II.  
PROPULSION AND INTERFERENCE AERODYNAMICS. HELD JUNE  
23, 1966, STATLER-HILTON HOTEL, BUFFALO, NEW YORK. (U)

JUN 66 330P

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME 1, AD-657 562 AND  
VOLUME 3, AD-657 564.

DESCRIPTORS: (\*HELICOPTERS; \*AERODYNAMIC  
CHARACTERISTICS), (\*VERTICAL TAKE-OFF PLANES,  
AERODYNAMIC CHARACTERISTICS), (\*SHORT TAKE-OFF  
PLANES, AERODYNAMIC CHARACTERISTICS), SYMPOSIA,  
PROPULSION, PROPELLERS(AERIAL), SHROUDED  
PROPELLERS, FANS, TURBINES, NOZZLES, WINGS,  
AIRFOILS, LIFT, SHEAR STRESSES, INTERFERENCE (U)

CONTENTS: PREDICTED AND MEASURED PERFORMANCE OF  
TWO FULL-SCALE DUCTED PROPELLERS; AEROTHERMAL  
DYNAMIC PERFORMANCE OF A HIGH BYPASS TIP TURBINE  
CRUISE FAN SYSTEM; THRUST DEFLECTION NOZZLES FOR  
VTOL AIRCRAFT; SHROUDED PROPELLER RESEARCH AT  
MISSISSIPPI STATE UNIVERSITY LEADING TO  
APPLICATION ON THE UNITED STATES ARMY XV-  
11A; THE LIFT, DRAG AND STABILITY OF WINGS  
IMMERSED IN PROPELLER SLIPSTREAM; AERODYNAMIC  
PROPERTIES OF AIRFOILS IN NONUNIFORMLY SHEARED FLOW;  
EXPERIMENTAL INVESTIGATION OF COMPOUND HELICOPTER  
AERODYNAMIC INTERFERENCE EFFECTS; MAXIMUM LIFT  
COEFFICIENT FOR STOL AIRCRAFT; A CRITICAL  
REVIEW. (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM06

AD-657 564 1/3 20/4 1/1  
CORNELL AERONAUTICAL LAB INC BUFFALO N Y

CAL/USAAVLABS SYMPOSIUM PROCEEDINGS, AERODYNAMIC  
PROBLEMS ASSOCIATED WITH V/STOL AIRCRAFT, VOLUME  
III, AERODYNAMIC RESEARCH ON BOUNDARY LAYERS, HELD  
JUNE 24, 1966, STATLER-HILTON HOTEL, BUFFALO, NEW  
YORK.

(U)

JUN 66 154P

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME 2, AD-657 563 AND  
VOLUME 4, AD-657 565.

DESCRIPTORS: (\*HELICOPTERS, \*AERODYNAMIC  
CHARACTERISTICS), (\*VERTICAL TAKE-OFF PLANES,  
AERODYNAMIC CHARACTERISTICS), (\*SHORT TAKE-OFF  
PLANES, AERODYNAMIC CHARACTERISTICS), SYMPOSIA,  
BOUNDARY LAYER, ROTOR BLADES (ROTARY WINGS),  
PERFORMANCE (ENGINEERING), HOVERING, BOUNDARY  
LAYER CONTROL SYSTEMS, LOW-DRAG AIRFOILS,  
FEASIBILITY STUDIES, LIFT

(U)

CONTENTS: SPANWISE FLOW EFFECTS ON ROTOR  
PERFORMANCE; A PRELIMINARY STUDY OF THE EFFECT OF A  
RADIAL PRESSURE GRADIENT ON THE BOUNDARY LAYER OF A  
ROTOR BLADE; THE BOUNDARY LAYER OF THE HOVERING  
ROTOR; AN INVESTIGATION OF THE FEASIBILITY OF A  
COMMON BOUNDARY LAYER CONTROL SYSTEM FOR HIGH-LIFT  
AND LOW-DRAG ON AN AIRFOIL SECTION.

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOH

AD-657 565 1/3 20/4 1/3  
CORNELL AERONAUTICAL LAB INC BUFFALO N Y

CAL/USAAVLABS SYMPOSIUM PROCEEDINGS. AERODYNAMIC PROBLEMS ASSOCIATED WITH V/STOL AIRCRAFT. VOLUME IV. PANELS ON RECOMMENDED V/STOL AERODYNAMIC RESEARCH, PANEL SUMMARIES, FEATURED SPEAKERS, AND TECHNICAL PAPER DISCUSSIONS. HELD JUNE 22-24, 1966, STATLER-HILTON HOTEL, BUFFALO, NEW YORK. (U)

JUN 66 382P

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME 3, AD-657 564.

DESCRIPTORS: (\*HELICOPTERS, \*AERODYNAMIC CHARACTERISTICS), (\*VERTICAL TAKE-OFF PLANES, AERODYNAMIC CHARACTERISTICS), (\*SHORT TAKE-OFF PLANES, AERODYNAMIC CHARACTERISTICS), SYMPOSIA, ROTARY WINGS, STABILITY, CONTROL, TILT WINGS, SCIENTIFIC RESEARCH (U)

THE FOLLOWING TECHNICAL PAPERS WERE PRESENTED: AERONAUTICAL RESEARCH REQUIREMENTS AS DETERMINED FROM THE X-19 AND X-100 VTOL PROGRAMS; THOUGHTS ON PROGRESS IN ROTATING-WING AERODYNAMICS; SOME POSSIBILITIES FOR RESEARCH ON STABILITY AND CONTROL AT STOL FLIGHT SPEEDS; AERODYNAMIC RESEARCH - IMPROVEMENTS OF THE TILT WING CONCEPT; AERODYNAMIC PROBLEM AREAS OF V/STOL AIRCRAFT AND RECOMMENDED RESEARCH; A DISCUSSION OF LOW SPEED VTOL AERODYNAMIC PROBLEMS AND SUGGESTIONS FOR RELATED RESEARCH; AREAS OF FRUITFUL RESEARCH AND DEVELOPMENT FOR ROTARY WING AIRCRAFT; A COMEBACK OF LOW-SPEED AERODYNAMICS RESEARCH; REQUIRED AERODYNAMIC RESEARCH FOR V/STOL AIRCRAFT; LOW SPEED AERODYNAMIC PROBLEMS ASSOCIATED WITH HELICOPTERS AND V/STOL AIRCRAFT; SELECTED RESEARCH RESULTS AND RECOMMENDATIONS FOR AERODYNAMIC RESEARCH; RECOMMENDATIONS FOR AERODYNAMIC RESEARCH ON HELICOPTERS AND V/STOL AIRCRAFT. (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOR

AD-658 432 1/3 20/4 1/1  
ARNOLD ENGINEERING DEVELOPMENT CENTER ARNOLD AIR FORCE  
STATION TENN

A REVIEW OF JET EFFLUX STUDIES APPLICABLE TO V/STOL  
AIRCRAFT, (U)

SEP 67 2UP GARNER, JACK E. I  
REPT. NO. AEDC-TR-67-163  
CONTRACT: AF 40(600)-1200  
PROJ: AF-7778

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH ARO,  
INC., TULLAHOMA, TENN.

DESCRIPTORS: (•EXHAUST GASES, •JETS), (•SHORT  
TAKE-OFF PLANES, EXHAUST GASES), STATE-OF-THE-ART  
REVIEWS, VERTICAL TAKE-OFF PLANES, FLOW FIELDS,  
SUBSONIC FLOW, THRUST (U)

THE STATE-OF-THE-ART OF JETS EXHAUSTING INTO A  
SUBSONIC CROSSFLOW IS PRESENTED. THESE STUDIES  
COMPLEMENT THE CURRENT RESEARCH EFFORT IN DEVELOPMENT  
OF AN ANALYTICAL DESCRIPTION OF THE FLOW FIELD  
CREATED BY A V/STOL AIRCRAFT. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOR

AD-658 545 1/3 5/2  
AIR FORCE FLIGHT TEST CENTER EDWARDS AFB CALIF

THE REPORT OF THE AD HOC COMMITTEE ON VSTOL  
TERMINOLOGY.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,  
JUL 67 17P RANSONE, ROBIN K. IBASQUEZ,  
JOSEPH G. ;  
REPT. NO. AFFTC-SP-67-1001

UNCLASSIFIED REPORT

DESCRIPTORS: (•VERTICAL TAKE-OFF PLANES,  
VOCABULARY); (•SHORT TAKE-OFF PLANES,  
VOCABULARY); HELICOPTERS, STANDARDIZATION,  
TAKE-OFF, AIRCRAFT LANDINGS, FLIGHT

(U)

THE REPORT IS A STANDARDIZED LIST OF DEFINITIONS  
ASSOCIATED WITH VERTICAL SHORT TAKEOFF AND  
LANDING AIRCRAFT. CONTRIBUTIONS WERE MADE FROM  
AMONG THE SEVERAL MILITARY SERVICES AND AIRCRAFT  
COMPANIES. (AUTHOR)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO: /ZOM08

AD-659 510 17/7 1/4  
ADCOLE CORP WALTHAM MASS

V/STOL APPROACH SYSTEM.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,

SEP 66 26P

CONTRACT: FA-WA-4582

PROJ: FAA-320-103-01N

MONITOR: FAA-RD 66-56

UNCLASSIFIED REPORT

DESCRIPTORS: (\*GLIDE PATH SYSTEMS, SHORT TAKE-OFF  
PLANES), (\*APPROACH INDICATORS, SHORT TAKE-OFF  
PLANES), VERTICAL TAKE-OFF PLANES, MICROWAVE  
EQUIPMENT, FEASIBILITY STUDIES, LANDING AIDS, K  
BAND, AIR TRAFFIC CONTROL SYSTEMS

(U)

THE REPORT DESCRIBES A FEASIBILITY MODEL MICROWAVE  
INSTRUMENT LANDING SYSTEM (ILS) DEVELOPED FOR  
THE FEDERAL AVIATION AGENCY. TRANSMITTED  
FREQUENCY: 15.4 KMC, LOCALIZER CLEARANCE:  
PLUS OR MINUS 45 DEGREES, GLIDE SLOPE  
CLEARANCE: PLUS OR MINUS 15 DEGREES. SYSTEM  
HAS BEEN SUCCESSFULLY DEMONSTRATED AT NAPEC.

(U)

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/ZOM08

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOR

AD-661 748 1/2 1/3 1/4  
ADVISORY GROUP FOR AERONAUTICAL RESEARCH AND DEVELOPMENT  
PARIS (FRANCE)

RECOMMENDATIONS FOR V/STOL HANDLING QUALITIES WITH AN  
ADDENDUM CONTAINING COMMENTS ON THE  
RECOMMENDATIONS. (U)

OCT 64 71P  
REPT. NO. AGARD-408A

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: NATO FURNISHED.

DESCRIPTORS: (•VERTICAL TAKE-OFF PLANES,  
HANDLING), (•SHORT TAKE-OFF PLANES, HANDLING),  
HELICOPTERS, FLIGHT, AERONAUTICS, FLIGHT CONTROL  
SYSTEMS, MANEUVERABILITY, STABILITY, HOVERING,  
ROLL, PITCH(MOTION) (U)

THE RECOMMENDATIONS, WHICH ARE NECESSARILY  
TENTATIVE, PARTICULARLY AS REGARDS THEIR APPLICATION  
TO LARGE AIRCRAFT, ARE BASED IN SOME RESPECTS ON  
REQUIREMENTS FOR U. S. MILITARY HELICOPTERS.  
BUT CONSIDERABLE USE HAS BEEN MADE OF THE RESULTS OF  
FLIGHT ASSESSMENTS OF HANDLING QUALITIES OF A NUMBER  
OF V/STOL RESEARCH AIRCRAFT. TO IMPROVE THEIR  
VALIDITY, THEY SHOULD BE KEPT UNDER CONTINUAL REVIEW  
BY CRITICAL, SYSTEMATIC COMPARISON WITH THE ACCEPTED  
HANDLING QUALITIES OF AS MANY NEW V/STOL AIRCRAFT  
AS POSSIBLE. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM0A

AD-661 951 20/4 1/1 14/2  
ADVISORY GROUP FOR AERONAUTICAL RESEARCH AND DEVELOPMENT  
PARIS (FRANCE)

TUNNEL-WALL EFFECTS ASSOCIATED WITH VTOL-STOL MODEL  
TESTING, (U)

MAR 59 34° KUHN, R. E. INAESETH, R.  
L. i  
REPT. NO. AGARD-303

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: NATO FURNISHED. PRESENTED AT THE  
INTERFERENCE EFFECTS MEETING OF THE AGARD FLUID  
DYNAMICS PANEL, 2-5 MAR, 1959, RHODE ST. GENESE,  
BELGIUM.

DESCRIPTORS: (•SHORT TAKE-OFF PLANES, MODEL  
TESTS), (•MODEL TESTS, INTERFERENCE), (•WIND  
TUNNELS, INTERFERENCE), WALLS, VERTICAL TAKE-OFF  
PLANES, LIFT, WINGS, CONFIGURATION, FLOW  
SEPARATION (U)

WIND-TUNNEL INVESTIGATIONS OF VTOL AND STOL  
AIRPLANE MODELS INVOLVE CONFIGURATIONS IN WHICH A  
LARGE AMOUNT OF POWER IS BEING USED TO GENERATE PART  
OF THE LIFT THROUGH THE MEDIUM OF PROPELLER  
SLIPSTREAMS OR JET EXHAUSTS DIRECTED DOWNWARD AT  
LARGE ANGLES TO THE FREE-STREAM DIRECTION. FOR  
MANY CONFIGURATIONS THE PROPELLERS OR JET EXHAUSTS  
ARE ARRANGED, FOR EXAMPLE, AS IN THE JET FLAP, TO  
COVER THE ENTIRE SPAN OF THE WING AND THUS TO ASSIST  
THE WIND IN ITS NATURAL PROCESS OF PRODUCING SO-  
CALLED 'CIRCULATION' LIFT. THIS ARRANGEMENT  
RESULTS IN THE STREAMLINES IN THE VICINITY OF THE  
WING ALSO BEING TURNED THROUGH LARGE ANGLES TO THE  
FREE-STREAM DIRECTION OF FLOW. THE PRESENCE OF THE  
TUNNEL WALLS, HOWEVER, IMPOSES THE CONDITIONS THAT  
THE STREAMLINES AT THE TUNNEL WALLS MUST BE PARALLEL  
TO THE FREE STREAM. THUS, THE PROBLEM OF TUNNEL-  
WALL EFFECTS IN VTOL-STOL MODEL TESTING IS  
SIMILAR TO THAT ASSOCIATED WITH CONVENTIONAL MODEL  
TESTING BUT DIFFERS GREATLY IN DEGREE. EXPERIENCE  
HAS SHOWN THAT, IN ADDITION TO THESE USUAL TUNNEL-  
WALL EFFECTS, FLOW SEPARATION ON THE MODEL CAN ALSO  
BE INDUCED BY THE TUNNEL WALLS. THE EXPERIENCES OF  
THE LANGLEY RESEARCH CENTER OF N.A.S.A.  
RELATED TO THESE PROBLEMS IN CLOSED-THROAT WIND  
TUNNELS ARE REVIEWED. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL No. /ZOM08

AD-662 686

1/2

HARVARD UNIV CAMBRIDGE MASS DIV OF ENGINEERING AND  
APPLIED PHYSICS

CONJUGATE GRADIENT METHODS WITH AN APPLICATION TO V/  
STOL FLIGHT-PATH OPTIMIZATION. (U)

DESCRIPTIVE NOTE: INTERIM TECHNICAL REPT.,  
NOV 67 36P MEHRA, R. K. BRYSON, A.  
E. JRI  
REPT. NO. TR-543  
CONTRACT: N00014-67-A-0298-0006  
PROJ: NR-372-012

UNCLASSIFIED REPORT

DESCRIPTORS: (•SHORT TAKE-OFF PLANES, FLIGHT  
PATHS), (•VERTICAL TAKE-OFF PLANES, FLIGHT  
PATHS), (•FLIGHT PATHS, OPTIMIZATION),  
ALGORITHMS, CONTROL, FLIGHT (U)

CONJUGATE GRADIENT METHODS HAVE RECENTLY BEEN  
APPLIED TO SOME SIMPLE OPTIMIZATION PROBLEMS AND HAVE  
BEEN SHOWN TO CONVERGE FASTER THAN THE METHODS OF  
STEEPEST DESCENT. THE PRESENT PAPER CONSIDERS  
APPLICATION OF THESE METHODS TO MORE COMPLICATED  
PROBLEMS INVOLVING TERMINAL AS WELL AS IN-FLIGHT  
CONSTRAINTS. A NUMBER OF METHODS ARE SUGGESTED TO  
HANDLE THESE CONSTRAINTS AND THE NUMERICAL  
DIFFICULTIES ASSOCIATED WITH EACH METHOD ARE  
DISCUSSED. THE PROBLEM OF FLIGHT-PATH OPTIMIZATION  
OF A V/STOL AIRCRAFT WAS CONSIDERED AND MINIMUM  
TIME PATHS FOR THE CLIMB PHASE WERE OBTAINED USING  
THE CONJUGATE GRADIENT ALGORITHM. IN CONCLUSION,  
SOME REMARKS ARE MADE ABOUT THE RELATIVE EFFICIENCY  
OF THE DIFFERENT OPTIMIZATION SCHEMES PRESENTLY  
AVAILABLE FOR THE SOLUTION OF OPTIMAL CONTROL  
PROBLEMS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOM

AD-663 756 5/2 1/3  
DAYTON UNIV OHIO RESEARCH INST

DEVELOPMENT AND EXPERIMENTAL EVALUATION OF A  
RETRIEVAL SYSTEM FOR AIR FORCE CONTROL-DISPLAY  
INFORMATION.

(U)

DESCRIPTIVE NOTE: FINAL SUMMARY REPT. 30 JUN 66-1 JUL  
67,

NOV 67 177P DEBONS, ANTHONY ISCHEFFLER,  
FREDERIC L. ISNIDE, JOHN D. ;  
CONTRACT: AF 33(615)-5310  
PROJ: AF-6190  
TASK: AF-619007  
MONITOR: AFFDL TR-67-119

UNCLASSIFIED REPORT

DESCRIPTORS: (\*INFORMATION RETRIEVAL,  
EFFECTIVENESS), (\*SHORT TAKE-OFF PLANES,  
DOCUMENTATION), CLASSIFICATION, CONTROL SYSTEMS,  
DISPLAY SYSTEMS, AIR FORCE EQUIPMENT, VERTICAL  
TAKE-OFF PLANES

IDENTIFIERS: COORDINATE INDEXING, THESAURI

(U)  
(U)

A PROPOSED CLASSIFICATION SYSTEM WAS STUDIED TO  
DETERMINE ITS EFFICACY TO THE AIR FORCE  
CONTROL-DISPLAY AREA. BASED ON NEGATIVE  
OUTCOMES FROM A LOGICAL ASSESSMENT OF THE PROPOSED  
SYSTEM, AN ALTERNATE SYSTEM WAS PROPOSED TO INCLUDE  
THE COORDINATE INDEX CONCEPT. UPON DEVELOPMENT OF  
A THESAURUS AND AN INDEX SYSTEM ON 106 DOCUMENTS IN  
THE VSTOL/VTOL AREA, AN EXPERIMENT WAS CONDUCTED  
TO DETERMINE THE ACCEPTANCE AND EFFECTIVENESS OF THE  
SYSTEM ON PROFESSIONAL WORKERS USING THE SYSTEM.  
FINDINGS REVEALED THAT THE COORDINATE SYSTEM WAS  
ACCEPTABLE TO THE USER AND THAT IT PROVIDED FOR THE  
RETRIEVAL OF RELEVANT DOCUMENTS BEYOND THAT EXPECTED  
BY CHANCE. THE STUDY SUGGESTS THAT THE COORDINATE  
INDEX SYSTEM AND THE PRESENT MEASURES USED TO STUDY  
ITS EFFECTIVENESS PROVIDE A RATIONALE FOR FURTHER  
EXPERIMENTATION WHICH CAN EXPAND THE BASE OF THE  
SYSTEM TO MEET THE NEED OF THE CONTROL-DISPLAY AREA.  
(AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-664 155 1/2 1/3  
AVIATION SAFETY ENGINEERING AND RESEARCH PHOENIX ARIZ

U. S. ARMY AC-1 DE HAVILLAND 'CARIBOU' EVALUATION,  
FT. RUCKER, ALABAMA, 21 JANUARY 1960. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
OCT 60 65P BRUGGINK, GERARD M. (CARROLL,  
JACK (KNOWLES, WILLIAM R. ;  
CONTRACT: DA-44-177-TC-624  
MONITOR: TRECOM TR-60-62

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: REPT. ON CRASH INJURY  
EVALUATION.

DESCRIPTORS: (\*SHORT TAKE-OFF PLANES, AVIATION  
ACCIDENTS), (\*TRANSPORT PLANES, CRASH INJURIES),  
AVIATION SAFETY, LANDING GEAR, DESCENT, SAFETY  
HARNESS, HAZARDS, HATCHES, MILITARY REQUIREMENTS,  
ARMY AIRCRAFT, TACTICAL AIR SUPPORT, AIRMOBILE  
OPERATIONS (U)  
IDENTIFIERS: C-7 AIRCRAFT, CRASHWORTHINESS (U)

THE CRASH INJURY EVALUATION OF THE U. S. ARMY  
AC-1 OH 'CARIBOU' DISCLOSED SEVERAL DESIRABLE  
CRASH SAFETY FEATURES INCLUDING A LIMIT LANDING GEAR  
STRENGTH WHICH PERMITS A VERTICAL RATE OF DESCENT OF  
14 FEET PER SECOND; THE LOCATION OF THE FUEL CELLS  
OUTBOARD OF THE ENGINE NACELLES; TROOP SEAT BELT  
ANCHORAGES WHICH ARE DIRECTLY SECURED TO BASIC  
AIRCRAFT STRUCTURE. ATTENTION IS INVITED TO THE  
REMEDIAL ACTION SUGGESTED IN THE RECOMMENDATIONS  
PERTAINING TO THESE DEFICIENCIES. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDMOR

AD-665 425 1/3

NORTHROP CORP HAWTHORNE CALIF NORAIR DIV

V/STOL GROUND-BASED SIMULATION TECHNIQUES. (U)

DESCRIPTIVE NOTE: FINAL REPT. 27 JUN 66-27 MAY 67,

NOV 67 73P SINACORI, J. B. I

REPT. NO. NOR-67-85

CONTRACT: DA-44-177-AMC-462(T)

PROJ: DA-1F125901A142

TASK: 1F125901A14233

MONITOR: USAAVLABS TR-67-55

UNCLASSIFIED REPORT

DESCRIPTORS: (•VERTICAL TAKE-OFF PLANES, •RESEARCH PLANES), (•SHORT TAKE-OFF PLANES, FLIGHT SIMULATORS), JET PLANES, PILOTS, LIFT, VISUAL PERCEPTION, DISPLAY SYSTEMS, HOVERING, ROLL, COCKPITS, PERFORMANCE(HUMAN), PERFORMANCE(ENGINEERING), FLIGHT TESTING, MOTION, FLIGHT CONTROL SYSTEMS, VERTIGO (U)  
IDENTIFIERS: X-14 AIRCRAFT, X-14A AIRCRAFT (U)

A STUDY OF VARIOUS KINDS OF SIMULATORS HAS BEEN MADE TO DETERMINE THEIR CAPABILITY TO PRODUCE DATA REPRESENTATIVE OF VISUAL FLIGHT. FOUR SIMULATIONS OF A JET-LIFT V/STOL AIRCRAFT WERE CONDUCTED USING THE SAME PILOT. CONTROL CHARACTERISTICS AND AIRFRAME PARAMETERS WERE MAINTAINED CONSTANT (AS CLOSELY AS POSSIBLE), AND THE SAME TASKS WERE USED BY THE PILOT IN EACH EVALUATION. THE RESULTING DATA WERE COMPARED WITH FLIGHT RESULTS FROM THE SAME AIRCRAFT. THE SIMULATORS USED DIFFERENT DISPLAYS, MOTION MODES, AND INSTRUMENTATION, AND THE RESULTS ARE DISCUSSED IN THE LIGHT OF THE CHARACTERISTICS OF EACH SIMULATOR. THE RESULTS SHOW CLEARLY THAT IN ORDER TO PRODUCE QUANTITATIVE DATA REPRESENTATIVE OF FLIGHT RESULTS, THE DISPLAY MUST HAVE A QUALITY LEVEL COMPATIBLE WITH THE TASK BEING PERFORMED. SPECIFICALLY, A PRECISION HOVERING TASK REQUIRES A HIGH RESOLUTION DISPLAY, WHILE A TRANSLATION (OR TRANSITION TASK) CAN BE PERFORMED WITH A DISPLAY OF MUCH LESS RESOLUTION. THE DISPLAY CONTENT IS IMPORTANT, PARTICULARLY FOR THE PRECISION HOVERING TASK WHERE HEIGHT HOLDING IS REQUIRED. FOR FLIGHT SIMULATION OF LARGE TRANSLATIONAL MOVEMENTS, COCKPIT MOTION DID NOT APPEAR TO AFFECT THE RESULTS;

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-667 427 1/3 20/4 1/1  
AIR VEHICLE CORP LA JOLLA CALIF

LINEARIZED INVISCID-FLOW THEORY OF TWO-DIMENSIONAL  
THIN JET PENETRATION INTO A STREAM. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
FEB 68 24P STRAND, T. IWEI, M. H. Y.

1  
REPT. NO. 355  
CONTRACT: DA-31-124-ARO(D)-311  
MONITOR: AROD 5274:4-E

UNCLASSIFIED REPORT

DESCRIPTORS: (SHORT TAKE-OFF PLANES, JET MIXING  
FLOW), TWO-DIMENSIONAL FLOW, JETS, PENETRATION,  
LINEAR SYSTEMS, VERTICAL TAKE-OFF PLANES,  
INTERFACES, INJECTION, THRUST REVERSE, THEORY,  
GROUND EFFECT (U)  
IDENTIFIERS: INVISCID FLOW, JET IMPINGEMENT (U)

THE POTENTIAL FLOW OF A STREAM THAT INTERACTS WITH  
A TWO-DIMENSIONAL THIN JET OF A DIFFERENT TOTAL HEAD,  
BEING INJECTED INTO THE STREAM FROM AN INFINITE PLANE  
SURFACE AT AN ARBITRARY ANGLE, IS ANALYZED USING  
NATURAL COORDINATES. THE VELOCITY MAGNITUDES ALONG  
THE INTERFACE AND THE NONDIMENSIONAL SHAPE OF THE  
INTERFACE BETWEEN THE JET AND THE STREAM ARE OBTAINED  
AS FUNCTIONS OF THE INJECTION ANGLE AND THE RATIO OF  
THE FREE STREAM VELOCITY TO THE VELOCITY IN THE JET  
AT INFINITY DOWNSTREAM. RESULTS ARE PRESENTED FOR  
SEVERAL CASES WHEN THE JET ISSUES AT OBLIQUE ANGLES  
FROM THE SURFACE, AND ALSO FOR THE LIMITING CASE WHEN  
THE JET OPPOSES THE FREE STREAM. THE LATTER CASE  
CORRESPONDS TO THE FLOW DUE TO ONE BRANCH OF A  
TRANSLATING TWO-DIMENSIONAL JET AFTER THE JET HAS  
BEEN SPLIT INTO TWO BRANCHES BY IMPINGEMENT ON THE  
GROUND. IT MIGHT ALSO CORRESPOND TO THE FLOW OF A  
TWO-DIMENSIONAL THRUST REVERSER. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-667 924 1/3 1/2 17/2  
BUNKER-RAMO CORP CANOGA PARK CALIF

ARMY AIRCRAFT VOICE-WARNING SYSTEM STUDY. (U)

DESCRIPTIVE NOTE: FINAL REPT. 10 AUG 67-10 JAN 68.  
FEB 68 230P BROWN, JAMES E. IBERTONE,  
CARMINE M. IOBERMAYER, RICHARD W. I  
REPT. NO. G0131-8U1  
CONTRACT: DAAD05-68-C-0025  
MONITOR: HEL TM-6-68

UNCLASSIFIED REPORT

DESCRIPTORS: (\*HELICOPTERS, EARLY WARNING  
SYSTEMS), (\*SHORT TAKE-OFF PLANES, EARLY WARNING  
SYSTEMS), (\*EARLY WARNING SYSTEMS, \*VOICE  
COMMUNICATION SYSTEMS), ARMY AIRCRAFT, OBSERVATION  
PLANES, PILOTS, MALFUNCTIONS, COCKPITS, AVIATION  
ACCIDENTS, HUMAN ENGINEERING, STATISTICAL ANALYSIS,  
DISPLAY SYSTEMS, AUDITORY SIGNALS, INSTRUMENT  
PANELS, MISSION PROFILES, JOB ANALYSIS,  
QUESTIONNAIRES (U)

IDENTIFIERS: \*VOICE-WARNING SYSTEMS, UH-1B  
AIRCRAFT, UH-1D AIRCRAFT, AH-1G AIRCRAFT, H-  
47 AIRCRAFT, CH-47 AIRCRAFT, H-54 AIRCRAFT, CH-  
54 AIRCRAFT, V-1 AIRCRAFT, OV-1 AIRCRAFT, H-1  
AIRCRAFT (U)

THE REPORT DESCRIBES AN ANALYTICAL STUDY THAT WAS  
INTENDED TO SERVE AS A BASIS FOR THE APPLICATION OF  
VOICE-WARNING SYSTEMS (VWS) FOR THE UH-1B AND  
UH-1D (HUEY), AH-1G (Cobra), CH-47  
(CHINOOK), CH-54 (SKYCRANE), AND OV-1  
(MOHAWK). THE FOLLOWING PROBLEMS OF INSTALLING  
A VWS IN THESE ARMY AIRCRAFT WERE STUDIED:  
(1) THE IDENTIFICATION AND SELECTION OF MESSAGES  
FOR MAXIMUM EFFECTIVENESS; (2) THE DETERMINATION  
OF PRIORITY SEQUENCES; AND (3) THE INTEGRATION OF  
THE VWS INTO EXISTING COCKPITS. THE STUDY  
INVOLVED THE COLLECTION OF BASIC DATA AND THE CONDUCT  
AND VALIDATION OF MISSION ANALYSES, OPERATIONAL  
SEQUENCE DIAGRAMS, TASK ANALYSES, AIRCRAFT  
CONFIGURATION ANALYSES, PILOT OPINION SURVEYS, AND  
ARMY AIRCRAFT ACCIDENT ANALYSES. IN THE REPORT,  
PRIORITY SEQUENCES ARE DERIVED FOR ALL MAJOR  
EMERGENCIES FOR THE SIX VEHICLES. FURTHER ANALYTICAL  
EFFORT IS DESCRIBED WHICH REDUCED THE LIST TO 20  
MESSAGES FOR INCLUSION IN THE VWS. FOR EACH  
AIRCRAFT, 2 LISTS OF 20 MESSAGES ARE PROPOSED:

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM08

AD-670 006 1/2 17/7  
NATIONAL AVIATION FACILITIES EXPERIMENTAL CENTER ATLANTIC  
CITY N J

VTOL AND STOL SIMULATION STUDY.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,  
APR 68 54P CONWAY, ROBERT C. I  
REPT. NO. NA-68-21  
PROJ: 150-533-01X  
MONITOR: FAA-RD 67-68

UNCLASSIFIED REPORT

DESCRIPTORS: (•AIR TRAFFIC CONTROL TERMINAL AREAS,  
SIMULATION), (•VERTICAL TAKE-OFF PLANES,  
AIRCRAFT LANDINGS), (•SHORT TAKE-OFF PLANES,  
AIRCRAFT LANDINGS), AIR TRAFFIC CONTROL SYSTEMS,  
GROUND SPEED, SIMULATORS, SEPARATION, RUNWAYS,  
APPROACH, NAVIGATIONAL AIDS, TERMINAL FLIGHT  
FACILITIES

(U)

A SIMULATION STUDY TO DETERMINE THE EFFECT ON AIR  
TRAFFIC CONTROL WHEN BOTH VERTICAL AND SHORT  
TAKEOFF AND LANDING AIRCRAFT ARE INTRODUCED INTO  
A TERMINAL AIR TRAFFIC CONTROL ENVIRONMENT WAS  
CONDUCTED. THE SIMULATION WAS CONDUCTED USING THE  
MODEL B DYNAMIC AIR TRAFFIC CONTROL  
SIMULATOR. SEVERAL APPROACH CONDITIONS, VARIOUS  
GLIDE SLOPE ANGLES, AND SEPARATION CRITERIA WERE  
INVESTIGATED TO DETERMINE THE EFFECT ON A TERMINAL  
ENVIRONMENT. IT WAS CONCLUDED THAT VERTICAL AND  
SHORT TAKEOFF AND LANDING AIRCRAFT COULD BE  
ACCOMMODATED IN THE TERMINAL AREA USING PRESENT  
OPERATIONAL PROCEDURES AS CONTAINED IN THE TERMINAL  
AIR TRAFFIC CONTROL MANUAL 7110.8.  
HOWEVER, WHEN VERTICAL AND SHORT TAKEOFF AND  
LANDING AIRCRAFT REDUCED FROM TERMINAL AREA SPEED  
TO A SLOW FINAL APPROACH SPEED, DIFFICULTIES WERE  
ENCOUNTERED IN PROVIDING NOT ONLY THE DESIRED SPACING  
BETWEEN THESE AIRCRAFT BUT BETWEEN THESE AIRCRAFT AND  
CONVENTIONAL AIRCRAFT IN THE SEQUENCE TO AND ON THE  
FINAL APPROACH COURSE. THESE PROBLEMS DID NOT  
EXIST WHEN VERTICAL AND SHORT TAKEOFF AND  
LANDING AIRCRAFT USED A FINAL APPROACH SPEED  
COMPATIBLE WITH THAT OF CONVENTIONAL AIRCRAFT.  
(AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-677 079 1/2 1/3  
INSTITUTE FOR DEFENSE ANALYSES ARLINGTON VA PROGRAM  
ANALYSIS DIV

THE DEMAND FOR INTERCITY PASSENGER TRANSPORTATION BY  
VTOL AIRCRAFT, VOLUME I: SUMMARY AND METHOD,

(U)

AUG 66 75P ASHER, NORMAN J. WETZLER,  
ELLIOT HOROWITZ, SEYMOUR M. SCHNEIDER, W.  
BARTZ I  
REPT. NO. R-144-VOL-1  
MONITOR: IDA/HQ 68-8872

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME 2, AD-677 080.

DESCRIPTORS: (\*TRANSPORT PLANES, SHORT TAKE-OFF  
PLANES), (\*VERTICAL TAKE-OFF PLANES, \*CIVIL  
AVIATION), AIR TRANSPORTATION, COSTS,  
PREDICTIONS, HELICOPTERS, TILT WINGS, HELICOPTER  
ROTORS, AIRCRAFT SEATS, DESIGN, AIR TRAFFIC,  
URBAN AREAS

(U)

IDENTIFIERS: COMPOUND HELICOPTERS, ROTOR-WING  
AIRCRAFT, \*PASSENGER TRANSPORTATION

(U)

AIRCRAFT DEMAND AND COST FUNCTIONS WERE ESTIMATED  
FOR SIX TYPES OF VTOL AIRCRAFT: CONVENTIONAL  
HELICOPTER, COMPOUND HELICOPTER, TILT ROTOR, TILT  
WING, STOWED ROTOR, AND FAN OR JET LIFT. FROM  
THESE FUNCTIONS TOTAL AIRCRAFT PROFIT OR LOSS AS A  
FUNCTION OF THE NUMBER OF AIRCRAFT PRODUCED WAS  
CALCULATED. RESULTS WERE CALCULATED FOR THE 90  
SEAT SIZE OF ALL SIX TYPES; IN ADDITION, 30, 60, 120  
AND 150 SEAT SIZES WERE ANALYZED FOR THE FAN OR JET  
LIFT TYPE. THE AIRCRAFT DEMAND WAS CALCULATED  
SEPARATELY FOR EACH DOMESTIC CITY PAIR AND THEN  
SUMMED TO OBTAIN TOTAL DOMESTIC DEMAND. THE  
DOMESTIC DEMAND WAS THEN INCREASED BY A CONSTANT  
RATIO TO ACCOUNT FOR EXPORT SALES. DEMAND IS BASED  
ON AIR TRAFFIC FOR 1985, THE ESTIMATED FINAL YEAR OF  
PRODUCTION FOR THESE FIRST GENERATION INTERCITY VTOL  
AIRCRAFT. VOLUME III PRESENTS GENERALIZED  
AIRCRAFT DEMAND BY CITY PAIR AS A FUNCTION OF VTOL  
AIRCRAFT FARE, BLOCK TIME AND NUMBER OF SEATS.  
WITH THESE DATA, THE USER OF THE REPORT CAN  
DETERMINE THE DEMAND FOR ANY VTOL PASSENGER  
TRANSPORT DESIGN. (AUTHOR)

(U)

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/ZOMOB

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM06

AD-677 080 1/2 1/3  
INSTITUTE FOR DEFENSE ANALYSES ARLINGTON VA PROGRAM  
ANALYSIS DIV

THE DEMAND FOR INTERCITY PASSENGER TRANSPORTATION BY  
VTOL AIRCRAFT. VOLUME II: APPENDICES, (U)

AUG 68 216P ASHER, NORMAN J. WETZLER,  
ELLIOT; HOROWITZ, SEYMOUR M. SCHNEIDER, W.  
BARTZ;  
REPT. NO. R-144-VOL-2  
MONITOR: IDA/HQ 68-8873

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME 3, AD-677 081.

DESCRIPTORS: (\*TRANSPORT PLANES, SHORT TAKE-OFF  
PLANES), (\*VERTICAL TAKE-OFF PLANES, \*CIVIL  
AVIATION), AIR TRANSPORTATION, HELICOPTERS,  
COSTS, AIR TRAFFIC, TILT WINGS, HELICOPTER  
ROTOR, ECONOMICS, TIME, DESIGN, AIRPORTS,  
STATISTICAL ANALYSIS, URBAN AREAS (U)  
IDENTIFIERS: COMPOUND HELICOPTERS, ROTOR-WING  
AIRCRAFT, \*PASSENGER TRANSPORTATION, INVESTMENT  
RETURNS (U)

CONTENTS: AIRCRAFT CHARACTERISTICS;  
DISTRIBUTION OF LOCAL ORIGINS AND DESTINATIONS;  
GROUND TRANSPORTATION TIME AND COST TO THE AIRPORT;  
AIRCRAFT COSTS; RATE OF RETURN ON INVESTMENT;  
AIRCRAFT LOAD FACTOR; NONPASSENGER REVENUE;  
CALCULATION OF AIRCRAFT FARES; COMPARATIVE COST  
ESTIMATES OF VERTIPTS AND AIRPORTS; DERIVATION OF  
PASSENGERS' VALUE OF TIME RELATIVE TO INCOME FROM THE  
1963 CENSUS OF TRANSPORTATION; VTOL STIMULATION OF  
AIR TRAVEL; LOCATION OF AIRPORTS AND  
VERTIPTS. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-677 081 1/2 1/3  
INSTITUTE FOR DEFENSE ANALYSES ARLINGTON VA PROGRAM  
ANALYSIS DIV

THE DEMAND FOR INTERCITY PASSENGER TRANSPORTATION BY  
VTOL AIRCRAFT. VOLUME III: GENERALIZED AIRCRAFT  
DEMAND BY CITY PAIR, (U)

AUG 68 20SP ASHER, NORMAN J. ; WETZLER,  
ELLIOT ; HOROWITZ, SEYMOUR M. ; SCHNEIDER, W.  
BARTZ ;  
REPT. NO. R-144-VOL-3  
MONITOR: IDA/HQ 68-8874

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME 4, AD-677 082.

DESCRIPTORS: (\*TRANSPORT PLANES, SHORT TAKE-OFF  
PLANES), (\*VERTICAL TAKE-OFF PLANES, \*CIVIL  
AVIATION), AIR TRANSPORTATION, AIR TRAFFIC,  
HELICOPTERS, TILT WINGS, HELICOPTER ROTORS,  
COSTS, STATISTICAL DATA, TABLES, URBAN  
AREAS (U)  
IDENTIFIERS: COMPOUND HELICOPTERS, ROTOR-WING  
AIRCRAFT, \*PASSENGER TRANSPORTATION (U)

FOR EACH CITY PAIR, RANGES OF VTOL BLOCK TIMES  
AND FARES WERE ASSUMED AND FOR EACH COMBINATION OF  
FARE AND BLOCK TIME THE NUMBER OF VTOL PASSENGERS  
BEFORE AND AFTER VTOL SPEED STIMULATION WERE  
CALCULATED, THEN FOR EACH FARE AND BLOCK TIME  
COMBINATION, THE NUMBER OF AIRCRAFT REQUIRED TO CARRY  
THE VTOL PASSENGERS (AFTER SPEED STIMULATION)  
WAS CALCULATED FOR A VARIETY OF AIRCRAFT SEATING  
CAPACITIES, AND THE ASSOCIATED DAILY ROUND-TRIP  
FREQUENCY WAS PRESENTED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-677 082 1/2 1/3  
INSTITUTE FOR DEFENSE ANALYSES ARLINGTON VA PROGRAM  
ANALYSIS DIV

THE DEMAND FOR INTERCITY PASSENGER TRANSPORTATION BY  
VTOL AIRCRAFT. VOLUME IV: SPECIFIC AIRCRAFT  
DEMAND BY CITY PAIR, (U)

AUG 68 112P ASHER, NORMAN J. ; WETZLER,  
ELLIOT ; HOROWITZ, SEYMOUR M. ; SCHNEIDER, W.  
BARTZ ;  
REPT. NO. R-144-VOL-4  
MONITOR: IDA/HQ 68-8875

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME I: AD-677 079.

DESCRIPTORS: (\*TRANSPORT PLANES, SHORT TAKE-OFF  
PLANES), (\*VERTICAL TAKE-OFF PLANES, \*CIVIL  
AVIATION), AIR TRANSPORTATION, AIR TRAFFIC,  
HELICOPTERS, TILT WINGS, HELICOPTER ROTORS,  
COSTS, STATISTICAL DATA, TABLES, URBAN AREAS,  
REGRESSION ANALYSIS (U)  
IDENTIFIERS: COMPOUND HELICOPTERS, ROTOR-WING  
AIRCRAFT, \*PASSENGER TRANSPORTATION (U)

IN ORDER TO ACCOMPLISH RAPID MASS CALCULATION OF  
DEMAND FOR MANY COMBINATIONS OF AIRCRAFT TYPE AND  
AIRCRAFT PRICE, THE GENERALIZED CITY-PAIR RESULTS OF  
VOLUME III (AD-677 081) WERE USED TO DEVELOP  
INDIVIDUAL CITY-PAIR REGRESSION EQUATIONS. THESE  
REGRESSION EQUATIONS MAKE VTOL PASSENGER DEMAND  
AFTER STIMULATION A FUNCTION OF FARE (WHICH VARIES  
DIRECTLY WITH AIRCRAFT PRICE) AND BLOCK TIME  
(WHICH VARIES DIRECTLY WITH AIRCRAFT TYPE).  
THE COEFFICIENTS OF THESE REGRESSION EQUATIONS ARE  
ONE OF THE SET OF INPUTS REQUIRED IN COMPUTER PROGRAM  
AIRDEMAN TO CALCULATE AIRCRAFT DEMAND FOR ALL 86  
CITY PAIRS. PASSENGER DEMAND IS TRANSLATED INTO  
AIRCRAFT DEMAND BY THE SAME GENERAL CONVERSION  
FORMULA THAT IS USED IN VOLUME III. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-684 964 1/3 20/1  
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF  
MECHANICAL ENGINEERING

NOISE STUDIES FROM THE FAN-IN-WING MODEL. (U)

DESCRIPTIVE NOTE: AERONAUTICAL REPT.,  
JUN 68 21P KRISHNAPPA, G. I  
MONITOR: NAE, NRC LR-508, 10605

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SHORT TAKE-OFF PLANES, DUCTED  
FANS), (\*DUCTED FANS, \*PROPELLER NOISE),  
SOUND, PROPAGATION, ACOUSTICS, HARMONIC  
ANALYSIS, PROPELLER BLADES, TURBINE STATORS,  
INTERACTIONS, TURBULENCE (U)  
IDENTIFIERS: BROADBAND ACOUSTIC NOISE, \*LIFT  
FANS (U)

SOME PRELIMINARY MEASUREMENTS OF NOISE FROM A  
HIGHLY LOADED FAN-IN-WING CONFIGURATION ARE REPORTED.  
MEASUREMENTS OF THE SPECTRA ARE PRESENTED FOR FAN  
SPEEDS OF 7500, 9750, AND 13,125 RPM (CORRESPONDING  
TO TIP MACH NUMBER 0.35, 0.45, AND 0.62) AT AN  
ANGLE OF 20 DEG. FROM THE AXIS OF THE FAN AND AT 5 FT  
FROM THE INLET AND EFFLUX FACES OF THE FAN. THE  
EXPERIMENTAL RESULTS SHOW A DISCRETE PEAK AT BLADE-  
PASSING FREQUENCY, SUPERIMPOSED ON A BROAD BAND NOISE  
THAT EXTENDS FROM 1000 C/S TO 15,000 C/S. AN  
ANALYSIS OF THE DUCT TRANSMISSION OF HIGHER ORDER  
MODES AT THE ABOVE ROTATIONAL SPEEDS REVEALS HIGH  
DECAY RATES. THIS EXPLAINS THE ABSENCE OF DISCRETE  
TONES AT THE HARMONICS OF THE BLADE-PASSING  
FREQUENCIES. THE PRESENCE OF HIGH INTENSITY BROAD  
BAND NOISE MAY BE ATTRIBUTED TO THE TURBULENCE IN THE  
WAKE AND FREE STREAM TURBULENCE AHEAD OF THE ROTOR  
BLADES. (AUTHOR) (U)

UNCLASSIFIED

/ZOMOB

UNCLASSIFIED

UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-685 610 20/1 1/3  
FEDERAL AVIATION ADMINISTRATION WASHINGTON D C OFFICE OF  
NOISE ABATEMENT

CONFERENCE ON STOL TRANSPORT AIRCRAFT NOISE  
CERTIFICATION.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT.

JAN 69 176P

REPT. NO. FAA-NO-69-1

PROJ: FAA-550-003-03H

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PROCEEDINGS OF THE INDUSTRY/  
GOVERNMENT CONFERENCE ON STOL TRANSPORT AIRCRAFT  
NOISE CERTIFICATION (1ST), WASHINGTON, D. C.,  
30 JAN 69.

DESCRIPTORS: (\*SHORT TAKE-OFF PLANES, \*NOISE),  
(\*TRANSPORT PLANES, AIRPLANE NOISE), DESIGN,  
ENGINE NOISE, PROPELLER NOISE, AIR TRAFFIC CONTROL  
SYSTEMS, ECONOMICS, SHROUDED PROPELLERS,  
SYMPOSIA

(U)

IDENTIFIERS: LIFT FANS, NOISE REDUCTION

(U)

THE PROCEEDINGS OF THE CONFERENCE INCLUDED PAPERS  
ON STOL DEVELOPMENT, STOL NOISE SOURCES, STOL  
NOISE ABATEMENT OPERATIONS, AND AIRCRAFT NOISE  
EVALUATION AND ARE ASSEMBLED FOR USE IN FUTURE  
ACTIVITIES RELATED TO STOL NOISE CERTIFICATION.  
EXAMPLES AND FIGURES ARE GIVEN ILLUSTRATING  
REPRESENTATIVE STOL CONFIGURATIONS AND ASSOCIATED  
NOISE CHARACTERISTICS AS WELL AS STOL PORT DESIGNS.  
(AUTHOR)

(U)



UNCLASSIFIED

UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-686 280 13/7 13/11 1/3  
HARRY DIAMOND LABS WASHINGTON D C

FLUIDIC GAS DIVERTER VALVES,

(U)

FEB 69 41P HOLMES, ALLEN B. ; GEHMAN,  
STACY E. ;  
REPT. NO. HDL-TR-1427  
PROJ: DA-1-P-125901-A-014, HDL-45140  
TASK: 1-F-125901-A01409

UNCLASSIFIED REPORT

DESCRIPTORS: (\*FLUIDICS, \*BUTTERFLY VALVES),  
(\*SHORT TAKE-OFF PLANES, JET ENGINE VALVES),  
EXHAUST GASES, MODEL TESTS, TURBULENCE, THRUST,  
DEFLECTION  
IDENTIFIERS: V-5 AIRCRAFT

(U)

(U)

A V/STOL CONFIGURATION USING TURBOJET EXHAUST FOR HOVERING AND JET THRUST FOR PROPULSION REQUIRES THE USE OF HIGH-CAPACITY DIVERTER VALVES. A STUDY WAS CONDUCTED TO INVESTIGATE THE APPLICATION OF FLUIDIC PRINCIPLES TO V/STOL DIVERTER VALVE DESIGN. DURING THE PROGRAM, THREE SUBSCALE VALVES WERE BUILT AND TESTED. EACH VALVE HAS TWO OUTPUTS, ONE FEEDING A SIMULATED TAIL EXHAUST PIPE AND ONE EXHAUSTING DIRECTLY TO ATMOSPHERE. THE OPERATION OF EACH VALVE DEPENDS UPON THE VISCOUS INTERACTION BETWEEN A TURBULENT FLOW AND A WALL. THE OBJECTIVE IS TO ESTABLISH THE FLOW DIVERSION CAPABILITIES AND JET MODE THRUST PERFORMANCE OF EACH MODEL. FLOW TESTS WERE CONDUCTED USING COMPRESSED AIR AT FLOW RATES RANGING TO 3000 CFM AT 30 PSI. THE IMPULSE DELIVERED AT THE OUTPUT OF EACH VALVE WAS MEASURED IN TERMS OF THE DEVELOPED THRUST PER UNIT MASS FLOW OVER A RANGE OF SUPPLY PRESSURES. DATA REPRESENTING THE RATIO BETWEEN DELIVERABLE IMPULSE AND ISENTROPIC IMPULSE ARE INCLUDED TO PROVIDE A MEANS FOR COMPARING THE DESIGNS. (AUTHOR)

(U)

UNCLASSIFIED

/ZOM08

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-687 167 1/3  
POLITECNICO DI TORINO (ITALY) ISTITUTO DI PROGETTO DI  
AEROMOBILI

PARAMETRIC INVESTIGATION OF STOL AIRCRAFT, (U)

JUN 60 73P GABRIELLI, GIUSEPPE ;  
REPT. NO. PUB-12  
MONITOR: AGARD OGRAPH-46

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PRESENTED AT THE SYMPOSIUM ON  
VERTICAL AND SHORT TAKE-OFF AND LANDING  
AIRCRAFT, PARIS, JUN 60, PT1 P71-140.

DESCRIPTORS: (SHORT TAKE-OFF PLANES,  
PERFORMANCE (ENGINEERING)), TAKE-OFF, AIRCRAFT  
LANDINGS, AIRCRAFT ENGINES, AERODYNAMIC  
CHARACTERISTICS, TURBOFAN ENGINES, AVIATION SAFETY,  
COSTS, ITALY (U)

THE PARAMETRIC INVESTIGATION CONSISTS OF THE  
EVALUATION OF THE MINIMUM TAKE-OFF AND LANDING  
LENGTHS, AS AFFECTED BY SOME PARAMETERS (WING  
LOADING, MAXIMUM LIFT COEFFICIENT, ENGINE THRUST TO  
AIRCRAFT A.U.W. RATIO, THRUS DEFLECTION  
ANGLE), FOR A JET PROPELLED STOL AIRCRAFT CAPABLE  
OF COMPLYING WITH ANY OTHER REQUIREMENT OF  
G.O.R. 2 (INCLUDING MISSION PROFILE, MILITARY  
LOADS, ETC.). THE TAKE-OFF PERFORMANCES ARE  
EVALUATED UNDER THE BASIC ASSUMPTIONS THAT THE TAKE-  
OFF FROM THE GROUND IS OBTAINED MAINLY THROUGH THE  
AERODYNAMIC LIFT OF A WING PROVIDED WITH HIGH LIFT  
DEVICES AND THAT THE AIRCRAFT IS MAINLY CONTROLLED  
DURING TAKE-OFF BY CONVENTIONAL AERODYNAMIC MEANS.  
AIRCRAFT WITH GEOMETRICALLY SIMILAR WINGS ARE  
CONSIDERED (THAT IS, HAVING IDENTICAL WING  
SECTIONS, PLANFORM, SWEEP-BACK ANGLE, ETC.). THE  
WING SHAPE WAS SELECTED. AIRCRAFT POWERED BY TWO  
DIFFERENT PROPULSION SYSTEMS ARE CONSIDERED AND  
COMPARED. THE FIRST PROPULSION SYSTEM CONSISTS OF  
A SINGLE HIGH BY-PASS AND MEDIUM COMPRESSION RATIO  
TURBOFAN ENGINE PROVIDED WITH SWIVELLING PROPELLING  
NOZZLES. THE ALTERNATE IS A COMPOSITE SYSTEM,  
CONSISTING OF A SINGLE MEDIUM BY-PASS AND HIGH  
COMPRESSION RATIO TURBOJET ENGINE GIVING HORIZONTAL  
THRUST AND OF TWO, OR MORE, BOOSTER TURBOJETS, TO BE  
USED DURING TAKE-OFF ONLY, HAVING A LOW COMPRESSION  
RATIO AND PROVIDED WITH PROPELLING NOZZLES WHICH MAY  
BE DEFLECTED DOWNWARDS AT DIFFERENT ANGLES.

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-688 921 1/3 1/1  
ADVISORY GROUP FOR AEROSPACE RESEARCH AND DEVELOPMENT  
PARIS (FRANCE)

THE AERODYNAMICS OF V/STOL AIRCRAFT. (U)

MAY 68 496P  
REPT. NO. AGARDOGRAPH-124

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: NATO FURNISHED. PRESENTED AT A  
LECTURE SERIES HELD AT THE INSTITUTE, RHODE-SAINT-  
GENESE (BELGIUM), 13-17 MAY 68.

DESCRIPTORS: (•SHORT TAKE-OFF PLANES, AERODYNAMIC  
CHARACTERISTICS), (•VERTICAL TAKE-OFF PLANES,  
AERODYNAMIC CHARACTERISTICS), GROUND EFFECT,  
HOVERING, INTERACTIONS, GROUND EFFECT MACHINES,  
HELICOPTERS, SHROUDED PROPELLERS, SHROUD RINGS,  
DUCTED FANS, TURBOJET ENGINES, TURBOFAN ENGINES,  
LIFT, AIRCRAFT LANDINGS, TAKE-OFF, FLIGHT  
TESTING, BOUNDARY LAYER CONTROL SYSTEMS, SYMPOSIA (U)  
IDENTIFIERS: LIFT FANS, TILT WINGS, TILT  
ROTORS (U)

THE PUBLICATION CONTAINS THE LECTURE NOTES PREPARED  
FOR THE AGARD-VKI LECTURE SERIES ON 'THE  
AERODYNAMICS OF V/STOL AIRCRAFT' WHICH  
TOOK PLACE AT THE VON KARMAN INSTITUTE, RHODE-  
SAINT GENESE, BELGIUM, FROM MAY 13 TO 17,  
1968. THE LECTURE SERIES WAS DESIGNED TO PROVIDE  
AN UP-TO-DATE ACCOUNT OF SPECIAL AERODYNAMIC PROBLEMS  
AND AERODYNAMIC REQUIREMENTS FOR V/STOL AIRCRAFT,  
INCLUDING A DISCUSSION OF THE PRESENT STATE OF  
KNOWLEDGE, NOVEL AERODYNAMIC ADVANCES, IMPORTANT  
AREAS FOR RESEARCH AND DEVELOPMENT, EXPERIMENTAL AND  
THEORETICAL TREATMENTS AS WELL AS IMMEDIATE AND LONG-  
TERM V/STOL AIRCRAFT PROSPECTS. IT WAS  
INTENDED FOR AERONAUTICAL ENGINEERS WITH A NEED TO  
ACQUIRE A MORE ADEQUATE BACKGROUND ON V/STOL  
AERODYNAMICS. (AUTHOR) (U)

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DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-689 106 1/2  
FEDERAL AVIATION ADMINISTRATION OKLAHOMA CITY OKLA NATIONAL  
FLIGHT INSPECTION DIV

EVALUATION OF MDC/EAL STOL DEMONSTRATION. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
MAY 69 113P BRYANT, BARNEY B. ; PARR,  
FRANK ;  
PROJ: FAA-68-460-3

UNCLASSIFIED REPORT  
PORTIONS OF THIS DOCUMENT ARE ILLEGIBLE. SEE  
INTRODUCTION SECTION OF THIS ANNOUNCEMENT JOURNAL FOR CFST,  
ORDERING INSTRUCTIONS.

DESCRIPTORS: (\*SHORT TAKE-OFF PLANES, \*FLIGHT  
PATHS); (\*AIR TRAFFIC CONTROL TERMINAL AREAS, AIR  
TRAFFIC), TRANSPORT PLANES, MANEUVERABILITY,  
NEW YORK, SCHEDULING, TURNING FLIGHT (U)  
IDENTIFIERS: BREGUET 941 AIRCRAFT, EVALUATION (U)

DATA WERE COLLECTED DURING A DEMONSTRATION OF THE  
BREGUET STOL TRANSPORT AIRCRAFT IN THE NEW  
YORK CITY AREA. ANALYSIS OF DATA WAS DIRECTED  
TO THE TERMINAL AREA MANEUVERING REQUIREMENTS.  
TURNING RADIUS FOR 80 KNOTS IAS WITH A 15 DEGREE  
BANK ANGLE APPEARED CORRECT FOR USE AS A MINIMUM  
STANDARD IN THE DEVELOPMENT OF DEPARTURE ROUTES AND  
HOLDING PATTERNS. THE ANGLE BETWEEN SUCCESSIVE  
ROUTE SEGMENTS LIMITS THE MINIMUM DISTANCE BETWEEN  
THE WAY-POINTS USED TO ESTABLISH THE INTERCEPTED  
SEGMENT. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-690 041 1/3 20/4 1/1  
GEORGIA INST OF TECH ATLANTA

EXPERIMENTAL AND ANALYTICAL INVESTIGATIONS OF JETS  
EXHAUSTING INTO A DEFLECTING STREAM, (U)

69 19P MOSHER, D. K. ; WU, J. C. ;  
WRIGHT, M. A. ;  
CONTRACT: DAHCO4-68-C-0004  
MONITOR: AR0D T-2:2-E

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN AIAA/AHS VTOL RESEARCH,  
DESIGN, AND OPERATIONS MEETING, GEORGIA INST. OF  
TECH., ATLANTA, 17-19 FEB 69. PAPER 69-223.

DESCRIPTORS: (SHORT TAKE-OFF PLANES, AERODYNAMIC  
CHARACTERISTICS), LIFT, JETS, INTERFERENCE,  
EXHAUST GASES, DEFLECTION, MASS TRANSFER, FLAT  
PLATE MODELS (U)

A CIRCULAR JET ISSUING NORMALLY FROM AN INFINITE  
FLAT PLATE INTO A DEFLECTING STREAM IS TREATED BY THE  
USE OF A POTENTIAL FLOW MODEL WHICH REPRESENTS THE  
FLOW FIELD SURROUNDING THE JET, EXCLUSIVE OF THE  
WAKE. THE RESULTS INDICATE THAT THE ENTRAINMENT OF  
DEFLECTING-STREAM FLUID INTO THE JET IS IMPORTANT IN  
DETERMINING THE PLATE PRESSURE AND THAT, FOR THE CASE  
WHERE THE JET SPEED IS MUCH HIGHER THAN THE  
DEFLECTING-STREAM SPEED, IT IS POSSIBLE TO USE A TWO-  
DIMENSIONAL REPRESENTATION. THE CALCULATED PLATE  
PRESSURE DISTRIBUTION IS COMPARED WITH RESULTS OF  
EXPERIMENTS. EXPERIMENTAL RESULTS (FLOW  
VISUALIZATION, PLATE PRESSURE, AND VELOCITY  
MEASUREMENTS) ARE PRESENTED FOR CIRCULAR AS WELL AS  
NON-CIRCULAR JETS EXHAUSTING AT VARIOUS JET  
VELOCITIES FROM A LARGE FLAT PLATE. RESULTS  
INDICATE THAT A STREAM-WISE JET EXIT CONFIGURATION IS  
DESIRABLE. (AUTHOR) (U)

UNCLASSIFIED

/ZOM08

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-691 220 1/3  
STEVENS INST OF TECH HOBOKEN N J DAVIDSON LAB

MODEL TESTS OF THE LOCKHEED AIR-SEA CRAFT. (U)

DESCRIPTIVE NOTE: FINAL REPT.,  
JUL 69 69P FRIDSMAN, GERARD ;  
REPT. NO. 1381  
CONTRACT: N00014-67-A-0202

UNCLASSIFIED REPORT

DESCRIPTORS: (•SEAPLANES, HYDRODYNAMICS),  
(•ANTISUBMARINE AIRCRAFT, SEAPLANES), (•SHORT  
TAKE-OFF PLANES, SEAPLANES), MODEL TESTS,  
PLANING SURFACES, SCALE, TAKE-OFF, AIRCRAFT  
LANDINGS, WATER WAVES, HYDRODYNAMIC CONFIGURATIONS,  
ANGLE OF ATTACK, YAW, LOADING(MECHANICS),  
FEASIBILITY STUDIES, HYDRO-SKIS (U)  
IDENTIFIERS: AIR SEA CRAFT (U)

A 1/25-SCALE MODEL OF THE AIR-SEA CRAFT WAS BUILT  
AND TESTED TO DETERMINE ITS LANDING AND TAKE-OFF  
CHARACTERISTICS IN SMOOTH WATER AND IN IRREGULAR  
WAVES. THE HYDRODYNAMIC CONFIGURATION WAS  
OPTIMIZED BY A COMPUTER STUDY AND BY SMOOTH-WATER  
CONSTANT-SPEED TESTS, WHICH DEVELOPED THE SIZE,  
LOCATION, AND ANGLES OF ATTACK OF THE PLANING  
SURFACES FOR STABLE OPERATION. STATIC AND DYNAMIC  
LOADS AS WELL AS THE MOTIONS OF THE CRAFT WERE  
MEASURED, OVER A RANGE OF OPERATING CONDITIONS, IN  
TESTS CONDUCTED WITH A YAWED MODEL AND IN TESTS  
INVOLVING MODEL TAKE-OFFS AND LANDINGS UP TO SEA  
STATE 5. THE RESULTS INDICATE THE AIR-SEA CRAFT TO  
BE A FEASIBLE AND PRACTICAL VEHICLE FOR CARRYING OUT  
THE ASW MISSION. (AUTHOR) (U)

UNCLASSIFIED

ODC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-697 191 1/3  
NATIONAL AERONAUTICAL ESTABLISHMENT OTTAWA (ONTARIO)

FLIGHT ASSESSMENT OF A VARIABLE-STABILITY  
HELICOPTER FOR STOL SIMULATIONS AND EVALUATION OF THE  
INFLUENCE OF SEVERAL LATERAL-DIRECTIONAL STABILITY  
DERIVATIVES. (U)

DESCRIPTIVE NOTE: AERONAUTICAL REPT.,  
JUN 69 30P MCGREGOR, D. M. ;  
REPT. NO. NAE-LR-524  
MONITOR: NRC 10953

UNCLASSIFIED REPORT

DESCRIPTORS: (•SHORT TAKE-OFF PLANES, SIMULATION),  
(•HELICOPTERS, •FLIGHT SIMULATORS), STABILITY,  
APPROACH, MANOEUVRABILITY, UTILITY PLANES,  
HANDLING, ROLL, PERFORMANCE(ENGINEERING),  
CANADA (U)

IDENTIFIERS: U-1 AIRCRAFT, OTTER AIRCRAFT (U)

A PARTICULAR STOL AIRCRAFT (THE DE  
HAVILLAND OF CANADA, •OTTER) WAS SIMULATED  
USING A VARIABLE-STABILITY HELICOPTER TO ASSESS THE  
SIMULATOR'S CAPABILITIES IN DUPLICATING THE FLIGHT  
CHARACTERISTICS OF THIS CLASS OF AIRCRAFT. DIRECT  
COMPARISONS WERE MADE BY THE PILOTS THROUGH ALTERNATE  
FLIGHTS IN THE SIMULATOR AND ON THE ACTUAL AIRCRAFT,  
AND THEY CONCLUDED THAT A VERY CONVINCING SIMULATION  
COULD BE EFFECTED, PARTICULARLY WITH RESPECT TO  
LATERAL-DIRECTIONAL CHARACTERISTICS. USING THE  
•OTTER AS THE BASE CONDITION, SEVERAL LATERAL-  
DIRECTIONAL STABILITY DERIVATIVES WERE VARIED TO  
INVESTIGATE THEIR INFLUENCES ON THE HANDLING  
QUALITIES DURING A LOW SPEED VISUAL MANOEUVRING AND  
APPROACH TASK. THE RESULTS OF THESE INVESTIGATIONS  
ARE PRESENTED IN THE FORM OF PILOT OPINION DATA.  
(AUTHOR) (U)

UNCLASSIFIED

/ZOM08

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-700 900 1/3  
DENVER UNIV COLO COLL OF ENGINEERING

AUTOMATIC STABILIZATION FOR V/STOL AIRCRAFT IN THE  
VERTICAL FLIGHT MODE. (U)

DESCRIPTIVE NOTE: MASTER'S THESIS,  
DEC 69 76P BUECHLER, RALPH LEE I

UNCLASSIFIED REPORT

DESCRIPTORS: (\*VERTICAL TAKE-OFF PLANES, FLIGHT  
CONTROL SYSTEMS); (\*SHORT TAKE-OFF PLANES, FLIGHT  
CONTROL SYSTEMS); (\*FLIGHT CONTROL SYSTEMS,  
STABILIZATION SYSTEMS), GUSTS, LIFT,  
OPTIMIZATION, POWER, GUST LOADS, THESES (U)  
IDENTIFIERS: AUTOMATIC CONTROL (U)

POSTULATING A SIMPLE DESCRIPTIVE AIRCRAFT TRANSFER  
FUNCTION FOR NON-AERODYNAMIC, SLOW SPEED FLIGHT, A  
CONTROL METHOD IS PRESENTED FOR THE AUTOMATIC  
STABILIZATION OF LARGE, LIFT-FAN VERTICAL AND  
SHORT TAKE-OFF AND LANDING (V/STOL)  
AIRCRAFT FLYING IN THE VERTICAL FLIGHT MODE. DEAD-  
ZONE (BANG-BANG) CONTROL IS EMPLOYED, AND THE  
ENTIRE SCHEME IS TIME OPTIMAL IN THE SENSE THAT THE  
ORIGIN IS OBTAINED AS FAST AS POSSIBLE FOLLOWING EXIT  
FROM A DEAD-ZONE REGION AND IS FUEL CONSERVATIVE IN  
THE SENSE THAT SMALL DEVIATIONS WITHIN THIS DEAD-ZONE  
ARE TOLERATED, CAUSING NO FUEL TO BE BURNED,  
ALTHOUGH THE METHOD IS NOT LIMITED TO ANY  
PARTICULAR AIRCRAFT TRANSFER FUNCTION OR DISTURBANCE  
SHAPE, IT IS USED TO CALCULATE THE APPROXIMATE  
REACTION JET CONTROL POWER NEEDED TO CONTROL THE  
MOMENTUM TRANSFER TO THE AIRCRAFT CREATED BY A  
DISCRETE GUST UNDER A MAXIMUM ROLL DEFLECTION  
CRITERION. (AUTHOR) (U)

UNCLASSIFIED

/ZOMOB



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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-701 728 1/3  
AEROSPACE RESEARCH LABS WRIGHT-PATTERSON AFB OHIO

THRUST AUGMENTATION CONSIDERATIONS FOR STOL AND  
EXTENDED CRUISE PROPULSION. (U)

DESCRIPTIVE NOTE: FINAL REPT.,  
NOV 69 25P CAMPBELL, WILLIAM S. ;  
REPT. NO. ARL-69-0182  
PROJ: AF-7116

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SHORT TAKE-OFF PLANES, \*THRUST  
AUGMENTATION), AERODYNAMIC CHARACTERISTICS,  
PERFORMANCE(ENGINEERING), LEVEL FLIGHT,  
INJECTION (U)  
IDENTIFIERS: EJECTOR POWERED WINGS (U)

THE APPLICATION OF THRUST AUGMENTATION CONCEPTS TO  
SHORT TAKE-OFF AND LANDING (STOL) AIRCRAFT  
PROPULSION IS DESCRIBED FOR SOME TYPICAL  
INSTALLATIONS. AERODYNAMIC AND EJECTOR THRUST  
EFFECTS ARE TREATED SEPARATELY SO THAT THE  
PERFORMANCE OF THE EJECTOR-POWERED WING CAN BE  
CALCULATED AS THAT OF A JET-FLAPPED AIRFOIL AND THE  
EJECTOR THRUST COMPONENTS THEN ADDED. SOME  
CONSIDERATIONS ON THE PERFORMANCE OF THE EJECTOR-  
POWERED WING IN CRUISE ARE INCLUDED. A PROGRAM FOR  
EJECTOR CALCULATIONS IS GIVEN. (AUTHOR) (U)

UNCLASSIFIED

/ZOM08

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-708 396 1/3 20/4  
WEST VIRGINIA UNIV MORGANTOWN DEPT OF AEROSPACE  
ENGINEERING

NON-STEADY FLOW THROUGH A HEAVILY LOADED ACTUATOR  
DISK, (U)

AUG 69 126P HU, JIA J. ; HSU, YU K. ;  
REPT. NO. TR-16  
CONTRACT: N00014-68-A-0512  
PROJ: NR-215-163

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: REPORT ON PROJECT THEMIS.

DESCRIPTORS: (\*VERTICAL TAKE-OFF PLANES, CARRIER  
LANDINGS), (\*SHORT TAKE-OFF PLANES, CARRIER  
LANDINGS), (\*AVIATION SAFETY,  
PROPELLERS(AERIAL)); (\*PROPELLER BLADES,  
AERODYNAMIC LOADING), (\*PROPELLER HUBS, AXIALLY  
SYMMETRIC FLOW), AIRFRAMES, VIBRATION,  
HELICOPTER ROTORS, AERODYNAMIC CHARACTERISTICS,  
PERTURBATION THEORY (U)

IDENTIFIERS: ACTUATOR DISK LOADING, NONSTEADY  
FLOW, THEMIS PROJECT (U)

THE PRESENT INVESTIGATION IS CONCERNED WITH THE  
NON-STEADY AXISYMMETRIC FLOW OF AN INVISCID,  
INCOMPRESSIBLE FLUID THROUGH A HEAVILY LOADED  
ACTUATOR DISK. SINCE THE STEADY STATE PROBLEM IS  
ESSENTIALLY NON-LINEAR, A CLOSED FORM SOLUTION IS NOT  
POSSIBLE. THE SMALL PERTURBATION THEORY IS  
APPLIED, AND THE FIRST-ORDER SOLUTION IS OBTAINED.  
THE RESULTING PERTURBATION EQUATIONS WHICH CONTAIN  
THE STEADY STATE SOLUTION AS COEFFICIENTS ARE SOLVED  
NUMERICALLY BY USING THE METHOD OF FINITE  
DIFFERENCES. THE NON-STEADY SOLUTIONS ARE COMPARED  
WITH THE ZERO-ORDER BASIC SOLUTIONS.  
(AUTHOR) (U)

UNCLASSIFIED

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-712 667 20/1 1/3 5/5  
SCHOOL OF AEROSPACE MEDICINE BROOKS AFB TEX

NOISE ASSOCIATED WITH OPERATION OF AIR FORCE OV-10A AIRCRAFT.

(U)

DESCRIPTIVE NOTE: FINAL REPT. APR-MAY 70.  
AUG 70 20P GASAWAY, DONALD C. ;  
REPT. NO. SAM-TR-70-51  
PROJ: AF-7755  
TASK: 775508

UNCLASSIFIED REPORT

DESCRIPTORS: (\*AIRPLANE NOISE, SHORT TAKE-OFF  
PLANES), (\*SHORT TAKE-OFF PLANES, HUMAN  
ENGINEERING), (\*RECONNAISSANCE PLANES, AIRPLANE  
NOISE), AVIATION MEDICINE, UTILITY PLANES,  
OBSERVATION PLANES, AUDITORY PERCEPTION,  
COCKPITS

(U)

IDENTIFIERS: COIN AIRCRAFT, OV-10A AIRCRAFT,  
V-10 AIRCRAFT

(U)

NOISE MEASUREMENTS ARE DESCRIBED FOR NEAR-FIELD  
POSITIONS DURING ENGINE-STARTING AND PRE-TAKEOFF  
PHASES OF THE OV-10A AIRCRAFT. THE INTERNAL  
NOISE ENVIRONMENT DURING VARIOUS PHASES OF GROUND AND  
AIRBORNE OPERATIONS IS DESCRIBED AND ILLUSTRATED.  
FEATURES OF AEROMEDICAL IMPORTANCE ARE EMPHASIZED.  
(AUTHOR)

(U)

UNCLASSIFIED

/ZOM08

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-713 138 1/3  
DOUGLAS AIRCRAFT CO LONG BEACH CALIF

A FLIGHT SIMULATOR STUDY OF STOL TRANSPORT LATERAL  
CONTROL CHARACTERISTICS. (U)

DESCRIPTIVE NOTE: FINAL REPT.,  
SEP 70 125P DRAKE, DOUGLAS E. IBERG,  
ROBERT A. IEPER, GARY L. ISHIRLEY, W. ALLEN;  
CONTRACT: DOT-FA69WA-2186  
MONITOR: FAA-RD 70-61

UNCLASSIFIED REPORT

DESCRIPTORS: (•SHORT TAKE-OFF PLANES, FLIGHT CONTROL  
SYSTEMS), (•FLIGHT CONTROL SYSTEMS, •ROLL),  
FLIGHT SIMULATORS, TRANSPORT PLANES, STABILIZATION  
SYSTEMS, STANDARDS (U)  
IDENTIFIERS: BREGUET 941 AIRCRAFT (U)

A SYSTEMATIC INVESTIGATION WAS CONDUCTED OF STOL  
TRANSPORT TERMINAL AREA LATERAL CONTROL  
CHARACTERISTICS TO IDENTIFY THE SIGNIFICANT  
CONSIDERATIONS AND ESTABLISH APPROPRIATE LATERAL  
CONTROL CRITERIA. THE INVESTIGATION CONSISTED OF AN  
ANALYSIS OF APPLICABLE EXISTING DATA AND A MOVING-  
BASE FLIGHT SIMULATOR TEST PROGRAM USING THE NASA  
AMES RESEARCH CENTER S-16 MOVING CAB  
TRANSPORT SIMULATOR. THE FLIGHT SIMULATOR  
PROGRAM COVERED A WIDE RANGE OF VEHICLE AERODYNAMIC  
AND PHYSICAL CHARACTERISTICS REPRESENTATIVE OF  
PRACTICAL STOL TRANSPORTS RANGING IN SIZE FROM 25,  
000 TO 130,000 POUNDS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-713 9:3 13/2

RUTGERS - THE STATE UNIV NEW BRUNSWICK N J EAGLETON INST  
OF POLITICS

COMPARISON OF AIR POLLUTION FROM AIRCRAFT AND  
AUTOMOBILES (PROJECT EAGLE).

(U)

DESCRIPTIVE NOTE: FINAL REPT.,

SEP 70 189P

BRIGHT, COOPER ; LAMMINEN,

TOIVO ; MULLALLY, JAMES ; MARKOWITZ, FOREST ; SINGER,

STANFORD M. I

CONTRACT: W1-70-1919-1

MONITOR: FAA-NO

70-14

UNCLASSIFIED REPORT

DESCRIPTORS: (\*AIR POLLUTION, \*EXHAUST GASES),  
(\*AIR TRANSPORTATION, AIR POLLUTION),  
(\*TRANSPORTATION, AIR POLLUTION), (\*SHORT TAKE-  
OFF PLANES, TRANSPORTATION), CONTROL, PASSENGER  
VEHICLES, CONNECTICUT, NEW JERSEY, NEW YORK,  
AIRPORTS, ATMOSPHERIC MOTION, CARBON MONOXIDE,  
DIFFUSION

(U)

IDENTIFIERS: \*HIGHWAY TRANSPORTATION, \*AUTOMOBILE  
EXHAUST, \*JET ENGINE EXHAUST, \*AIR POLLUTION  
CONTROL, COMPARISON, EAGLE PROJECT, PREDICTIONS,  
ABATEMENT, MASS TRANSPORTATION

(U)

THIS INVESTIGATION INTO THE ENVIRONMENTAL ASPECTS  
OF ESTABLISHING AN URBAN AIR TRANSPORTATION SYSTEM  
FOR THE TRI-STATE AREA OF CONNECTICUT, NEW  
JERSEY, AND NEW YORK FOR DAILY COMMUTING  
DEMONSTRATES THAT AIR POLLUTION AND ITS ASSOCIATED  
PHYSIOLOGICAL EFFECTS, WHICH ARE CREATED BY  
AUTOMOBILE ENGINE EMISSIONS, CAN BE DRASTICALLY  
REDUCED. SIMILAR RESULTS PERTAIN WHEN STOL AIR  
TRANSPORTATION IS SUBSTITUTED FOR AUTOMOBILES TO  
PROVIDE SERVICE FOR THE SAME AREA TO THE THREE MAJOR  
AIRPORTS AROUND NEW YORK CITY. FURTHER, THE  
STUDY SHOWS THAT AIR POLLUTION AT A STOLPORT IN  
MANHATTAN SUPPORTING SUCH A SYSTEM WOULD BE LESS  
THAN THE NORMAL BACKGROUND CONCENTRATION, EVEN DURING  
PEAK TRAVEL PERIODS. (AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-714 938 20/4 1/1 14/2  
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO)

OBSERVATIONS OF TUNNEL FLOW SEPARATION  
INDUCED BY AN IMPINGING JET, (U)

APR 70 22P TYLER, R. A. ; WILLIAMSON, R.  
G. I  
REPT. NO. NRC-11617  
MONITOR: NAE LR-537

UNCLASSIFIED REPORT

DESCRIPTORS: (\*FLOW SEPARATION, \*JETS), (\*SHORT  
TAKE-OFF PLANES, FLOW SEPARATION); WIND TUNNEL  
MODELS; MODEL TESTS; NOZZLE GAS FLOW, CANADA (U)  
IDENTIFIERS: JET IMPINGEMENT (U)

SINGLE JETS WERE DIRECTED TOWARDS, AND  
PERPENDICULAR TO, THE BOUNDARY OF THE 10-FT X 20-FT  
TEST SECTION OF THE NRC V/STOL PROPULSION  
TUNNEL. THE POSITION OF TUNNEL FLOW SEPARATION,  
ARISING FROM JET IMPINGEMENT AND FORWARD PENETRATION,  
WAS DETERMINED FROM WOOL TUFT OBSERVATIONS FOR  
VARIOUS CONDITIONS OF JET GEOMETRY, JET VELOCITY, AND  
TUNNEL SPEED, RELEVANT TO V/STOL MODELS INVOLVING  
DISCRETE JETS. THE RESULTS INDICATED THE SEPARATION  
POSITION, RELATIVE TO THE JET NOZZLE, TO BE A SIMPLE  
FUNCTION OF THE PRODUCT OF EFFECTIVE MAINSTREAM/JET  
VELOCITY RATIO AND NOZZLE HEIGHT/DIAMETER RATIO. A  
VALUE OF THIS PRODUCT GREATER THAN 1.5 WAS FOUND TO  
BE NECESSARY TO ENSURE TUNNEL FLOW SEPARATION  
DOWNSTREAM OF THE JET NOZZLE. AN APPROXIMATE  
EXTENSION TO INCLINED JETS, BASED ON LIMITED TEST  
DATA, IS INCLUDED. (AUTHOR) (U)

UNCLASSIFIED

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-715 223 1/5  
AMERICAN AIRLINES NEW YORK

TECHNICAL FEASIBILITY OF FLOATING INTERIM  
MANHATTAN STOLPORT. (U)

DESCRIPTIVE NOTE: FINAL REPT.

SEP 70 108P

CONTRACT: DOT-FA70WA-2411

PROJ: FAA-504-203-05H

MONITOR: FAA-RD 70-67

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH HOWARD,  
NEEDLES, TAMMEN AND BERGENOFF, SEATTLE, WASH. AND  
GIBBS AND COX, INC., NEW YORK.

DESCRIPTORS: (\*AIRPORTS, FLOATING BODIES),  
(\*SHORT TAKE-OFF PLANES, AIRPORTS), FEASIBILITY  
STUDIES, NEW YORK, RIVERS, SITE SELECTION,  
COSTS, FLIGHT DECKS, SHIP HULLS (U)  
IDENTIFIERS: \*FLOATING STOLPORTS, \*STOLPORTS,  
COST ESTIMATES (U)

THE TECHNICAL FEASIBILITY OF A FLOATING INTERIM  
MANHATTAN STOLPORT, LOCATED IN THE HUDSON  
RIVER NEAR W. 30TH STREET, IS EXAMINED WITH  
REGARD TO THE SUITABILITY OF THE SITE FOR ATTAINING  
UNOBSTRUCTED AIRSPACE PROTECTION SURFACES, ASSURING  
FREEDOM FROM INTERFERENCE WITH RIVER NAVIGATION, AND  
HAVING MINIMAL IMPACT ON THE EXISTING SURFACE  
TRANSPORTATION NETWORK. THE REPORT PRESENTS AN  
ENGINEERING ANALYSIS AND COST ESTIMATE OF THE FLOATING  
STRUCTURE, INCLUDING FACILITIES REQUIRED IN SUPPORT  
OF STOLPORT OPERATIONS. THE SITE IS FOUND TO BE  
SUITABLE FOR A FLOATING INTERIM STOLPORT, AND  
THE MOST FEASIBLE FLOATING STRUCTURE WOULD CONSIST OF  
A FLIGHT DECK SUPPORTED ON INTERCONNECTED LIBERTY  
SHIP HULLS. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-715 553 1/3  
ADVISORY GROUP FOR AEROSPACE RESEARCH AND DEVELOPMENT  
PARIS (FRANCE)

V/STOL HANDLING. 1. CRITERIA AND  
DISCUSSION.

(U)

DEC 70 53P  
REPT. NO. AGARD-577

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: NATO FURNISHED.

DESCRIPTORS: (•VERTICAL TAKE-OFF PLANES,  
HANDLING), STANDARDS, SHORT TAKE-OFF PLANES,  
FLIGHT SIMULATORS, STABILITY, HELICOPTERS

(U)

THE REPORT PRESENTS CRITERIA ON HANDLING QUALITIES  
FOR VTOL AND STOL AIRCRAFT. INCLUDED WITH EACH  
CRITERION IS A DISCUSSION POINTING OUT THE PILOT'S  
REASONS FOR INCLUDING A PARTICULAR HANDLING QUALITY  
FEATURE. THE CRITERIA ARE BASED ON RESULTS OF TESTS  
USING PILOTED GROUND-BASED SIMULATORS, VARIABLE  
STABILITY AIRCRAFT, PARTICULAR MODELS OF VTOL AND  
STOL AIRCRAFT, AND VARIABLE STABILITY HELICOPTERS.  
(AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-718 798 20/4 1/1  
GEORGIA INST OF TECH ATLANTA SCHOOL OF AEROSPACE  
ENGINEERING

AN EXPERIMENTAL INVESTIGATION OF A TURBULENT  
JET IN A CROSS FLOW.

(U)

DESCRIPTIVE NOTE: DOCTORAL THESIS,  
DEC 70 182P MOSHER, DAVID K. ;  
REPT. NO. GIT-AER-70-7  
CONTRACT: DAHCO4-68-C-0004  
MONITOR: AROD T-2:17-E

UNCLASSIFIED REPORT

DESCRIPTORS: (\*JET MIXING FLOW, INTERFERENCE),  
(\*SHORT TAKE-OFF PLANES, LIFT), THRUST,  
INTERACTIONS, FLOW VISUALIZATION, VERTICAL TAKE-  
OFF PLANES, FLAT PLATE MODELS, THESES

(U)

IDENTIFIERS: \*CROSS FLOW, THEMIS PROJECT

(U)

THE INTERFERENCE PHENOMENON OCCURRING WHEN A  
SUBSONIC TURBULENT JET EXHAUSTS NORMALLY FROM A LARGE  
FLAT PLATE INTO A LOW SPEED CROSSFLOW WAS  
EXPERIMENTALLY INVESTIGATED IN THE GEORGIA TECH  
NINE FOOT WIND TUNNEL. STATIC PRESSURES WERE  
MEASURED ON THE SURFACE AROUND THE JET, IN THE  
REGION OFF THE SURFACE, INCLUDING THE JET PLUME, WAKE  
AND SURROUNDING AREAS, THE AVERAGE TOTAL AND STATIC  
PRESSURES AND THE AVERAGE VELOCITY MAGNITUDES AND  
DIRECTIONS WERE DETERMINED. THREE JET EXIT  
CONFIGURATIONS WERE STUDIED, ONE CIRCULAR AND TWO  
SLOT-SHAPED WITH WIDTH TO LENGTH RATIOS OF 0.3 AND  
3.4. ALL HAVE THE SAME EXIT AREA. THE EFFECTIVE  
JET TO CROSS-FLOW VELOCITY RATIO WAS VARIED, FOR EACH  
OF THE EXIT CONFIGURATIONS, OVER THE RANGE 4.0 TO  
12.0. ANALYSIS OF THE DATA INDICATES THAT THE  
PRESSURE DISTRIBUTIONS INDUCED ON THE SURFACE ARE A  
COMBINED RESULT OF THE JET'S BLOCKING AND ENTRAINING  
EFFECTS ON THE CROSS FLOW WITH ENTRAINMENT BECOMING  
THE MORE DOMINANT OF THE TWO AS THE EFFECTIVE  
VELOCITY RATIO IS INCREASED. THIS RELATIVE  
DOMINANCE BRINGS ABOUT AN ATTENUATION OF TOTAL  
INTERFERENCE LIFT LOSS (WHEN COMPUTED AS A FRACTION  
OF GROSS THRUST) PRIMARILY BY CAUSING A RISE IN THE  
LOW PRESSURES IN THE WAKE REGION AS THE EFFECTIVE  
VELOCITY RATIO INCREASES. WHEN THE EFFECTIVE  
VELOCITY RATIO IS HELD FIXED, THE TOTAL INTERFERENCE  
LIFT LOSS INCREASES WITH INCREASING WIDTH TO LENGTH  
RATIO OF THE JET EXIT. (AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-719 742 1/3 20/4  
FRANK J SEILER RESEARCH LAB UNITED STATES AIR FORCE  
ACADEMY COLO

NONLINEAR VORTEX INTERACTIONS ON WING-  
CANARD CONFIGURATIONS,

(U)

FEB 71 17P FINKLEMAN, DAVID ;  
REPT. NO. SRL-TR-71-0003  
PROJ: AF-7905  
TASK: 790500

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PRESENTED AT THE AEROSPACE SCIENCE  
MEETING (9TH), 25-27 JAN 71. AIAA PAPER 71-  
95.

DESCRIPTORS: (\*CANARD CONFIGURATION, LIFT),  
(\*SHORT TAKE-OFF PLANES, AERODYNAMIC  
CHARACTERISTICS), THIN WINGS, VORTICES,  
MANEUVERABILITY, MATHEMATICAL MODELS, STABILITY,  
PRESSURE, WAKE

(U)

IDENTIFIERS: \*SLENDER WINGS, \*WING CANARD  
CONFIGURATIONS, PRESSURE DISTRIBUTION, \*VIGGEN  
AIRCRAFT

(U)

CLOSE-COUPLED WING-CANARD CONFIGURATIONS ARE  
IDEALLY SUITED TO APPLICATIONS IN WHICH HIGH AIRCRAFT  
MANEUVERABILITY IS REQUIRED AT MODERATE SPEEDS.  
THE SAAB VIGGEN HAS EXPLOITED THE ADVANTAGES OF  
PLACING CANARD AND WING CLOSE TOGETHER, BUT NO THEORY  
HAS BEEN CAPABLE OF PREDICTING THE AERODYNAMICS OF  
THIS AIRCRAFT. IN THIS INVESTIGATION SACKS,  
METHOD OF SIMULATING VORTEX SHEETS WITH DISTRIBUTIONS  
OF DISCRETE VORTICES HAS BEEN APPLIED TO THE STUDY OF  
THE INTERACTION OF A SLENDER WING WITH A NEARLY  
CANARD SURFACE. THE CANARD IS DETRIMENTAL TO BOTH  
LIFT AND STATIC LONGITUDINAL STABILITY. THE EXTENT  
OF CANARD WAKE ROLL-UP IS IMPORTANT IN THE  
INTERACTION, AND THE FLATTER THE WAKE THE MORE  
ADVERSE IS THE INTERACTION. DOWNWARD CANARD  
DEFLECTION MAY LEAD TO INCREASES IN LIFT OF THE  
ENTIRE CONFIGURATION, AND IT IS OBSERVED THAT FOR  
SMALL VERTICAL SEPARATIONS BETWEEN THE SURFACES THE  
FORWARD PORTION OF THE WING IS INEFFECTIVE IN  
PRODUCING LIFT. IT IS DEMONSTRATED THAT THE CANARD  
CAN DIRECTLY AFFECT THE PRESSURE DISTRIBUTION ON THE  
WING AND APPLICATION OF THIS CONFIGURATION TO DIRECT  
LIFT CONTROL AND CONTROL CONFIGURED AIRCRAFT ARE  
NOTED. (AUTHOR)

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DCC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-720 259 1/3 1/1 20/4  
ADVISORY GROUP FOR AEROSPACE RESEARCH AND DEVELOPMENT  
PARIS (FRANCE)

ASSESSMENT OF LIFT AUGMENTATION DEVICES. (U)

DESCRIPTIVE NOTE: LECTURE SERIES.

FEB 71 287P

REPT. NO. AGARD-LS-43-71

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PRESENTED AT A LECTURE SERIES HELD  
AT INSTITUTE, RHODE-SAINT-GENESE (BELGIUM), ON  
20-24 APR 70. NATO FURNISHED.

DESCRIPTORS: (\*SHORT TAKE-OFF PLANES, LIFT),  
(\*LIFT; \*AERODYNAMIC CONFIGURATIONS),  
AERODYNAMIC CHARACTERISTICS, VARIABLE-SWEEP WINGS,  
FLOW SEPARATION, TWO-DIMENSIONAL FLOW, MODEL  
TESTS, TRANSPORT PLANES, COST EFFECTIVENESS,  
LEADING EDGE, JET FLAPS, SYMPOSIA

IDENTIFIERS: \*LIFT AUGMENTATION DEVICES

(U)

(U)

CONTENTS: AERODYNAMICS OF MECHANICAL HIGH-LIFT  
DEVICES; AERODYNAMICS OF PNEUMATIC HIGH-LIFT  
DEVICES; AERODYNAMICS OF VARIABLE SWEEP;  
FUNDAMENTAL ASPECTS OF FLOW SEPARATION UNDER HIGH-  
LIFT CONDITIONS; SOME NOTES ON TWO-DIMENSIONAL  
HIGH-LIFT TESTS IN WIND-TUNNELS; MODEL TESTING  
REQUIREMENTS AND TECHNIQUES FOR HIGH-LIFT SCHEMES--  
THREE-DIMENSIONAL ASPECTS; ANALYSIS OF TRANSPORT  
APPLICATIONS FOR HIGH-LIFT SCHEMES; ANALYSIS OF  
COMBAT AIRCRAFT APPLICATIONS FOR LIFT-AUGMENTATION  
DEVICES; FLIGHT TESTING MILITARY TRANSPORT AIRCRAFT  
FOR CLEARANCE IN THE STOL ROLE; LIFT-AUGMENTATION  
DEVICES AND THEIR EFFECT ON THE ENGINE; OPTIMISING  
THE PROPULSIVE/LIFT SYSTEM FOR TURBOFAN STOL  
AIRCRAFT CONSIDERING COST EFFECTIVENESS; A NEW  
TECHNIQUE FOR AEROFOIL LEADING-EDGE STUDIES; SOME  
COMMENTS ON CHARACTERISTICS OF HIGH-LIFT WINGS; THE  
HUNTING H.126 JET-FLAP RESEARCH AIRCRAFT;  
AERODYNAMIC RESEARCH ON HIGH-LIFT SYSTEMS.

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-721 166 1/3 1/2  
CIVIL AERONAUTICS BOARD WASHINGTON D C

CIVIL AERONAUTICS BOARD PLANNING STUDY;  
STOL-VTOL AIR TRANSPORTATION SYSTEMS,

(U)

MAR 70 37P HINTZE, CARL, JR;

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SHORT TAKE-OFF PLANES, AIR  
TRANSPORTATION), (\*VERTICAL TAKE-OFF PLANES, AIR  
TRANSPORTATION), (\*AIR TRANSPORTATION, \*CIVIL  
AVIATION), (\*URBAN PLANNING, AIR  
TRANSPORTATION), DESIGN, ECONOMICS, SOCIOLOGY

(U)

THE STUDY WAS PREPARED TO PROVIDE INFORMATION TO  
THE CIVIL AERONAUTICS BOARD MEMBERS AND STAFF  
ON THE CURRENT STATUS OF STOL AND VTOL AIRCRAFT,  
TERMINALS, AND ALLIED FACILITIES. THE STUDY IS A  
CONSOLIDATION OF AVAILABLE INFORMATION ARRANGED TO  
INDICATE THE CONSENSUS OF OPINION OF THE VARIOUS  
AUTHORITIES IN THE FIELD. THE MAJOR DESIGN CONCEPTS  
OF STOL AND VTOL AIRCRAFT AND SUPPORT SYSTEMS ARE  
DESCRIBED IN RELATIVELY NON-TECHNICAL TERMS.  
INCLUDED IS A BRIEF DESCRIPTION OF THE CHANGING  
SOCIO-ECONOMIC ASPECTS OF THE MAJOR METROPOLITAN  
AREAS OF THE NATION AND THEIR ANTICIPATED EFFECTS ON  
URBAN TRANSPORTATION REQUIREMENTS. THE STUDY  
SUMMARIZES THE PROBABLE COURSE OF EVENTS IN THE  
EVOLUTION OF STOL AND VTOL AIR TRANSPORTATION  
SYSTEMS, AND FUTURE PROJECTIONS. (AUTHOR)

(U)

UNCLASSIFIED

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AL-723 294 14/2 20/4 1/1  
ARNOLD ENGINEERING DEVELOPMENT CENTER ARNOLD AIR FORCE  
STATION TENN

AN INVESTIGATION OF SEVERAL SLOTTED WIND  
TUNNEL WALL CONFIGURATIONS WITH A HIGH DISC  
LOADING V/STOL MODEL.

(U)

DESCRIPTIVE NOTE: FINAL REPT. 1 JUL 66-30 JUN 70,  
MAY 71 65P BINION, T. W. : JRI  
REPT. NO. AEDC-TR-71-77  
CONTRACT: F40600-71-C-0002  
PROJ: ARO-PD3714, ARO-PD3014

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH ARO,  
INC., TULLAHOMA, TENN, REPT. NO. ARO-PWT-TR-  
71-43. MASTERS THESIS.

DESCRIPTORS: (\*WALLS, CONFIGURATION), (\*MODEL  
TESTS, INTERFERENCE), (\*WIND TUNNELS, SHORT  
TAKE-OFF PLANES), DESIGN, WIND TUNNEL MODELS,  
AERODYNAMIC SLOTS, SUBSONIC CHARACTERISTICS, WAKE,  
AIRPLANE MODELS

(U)

IDENTIFIERS: \*SLOTTED WALL CONFIGURATIONS, DISC  
LOADING

(U)

THE INVESTIGATION REPORTED HEREIN IS THE  
EXPERIMENTAL PORTION OF A UNIFIED THEORETICAL AND  
EXPERIMENTAL SEARCH FOR A SLOTTED WIND TUNNEL WALL  
CONFIGURATION WITH MINIMAL INTERFERENCE FOR  
CONVENTIONAL AND V/STOL MODELS. IT IS SHOWN  
THAT THEORY AND EXPERIMENT ARE IN EXCELLENT AGREEMENT  
FOR THE CLASSICAL CASE PROVIDED AN APPROPRIATE  
EXPRESSION IS USED TO RELATE THE WALL GEOMETRY TO THE  
BOUNDARY CONDITION. CLASSICAL DATA CORRECTION  
EQUATIONS ARE NOT APPROPRIATE FOR THE V/STOL  
CASE, HOWEVER, AN ADDITIONAL TERM, NOT PREDICTED BY  
THEORY, IS NEEDED TO ACCOUNT FOR CHANGES IN THE JET  
WAKE. GEOMETRIC PARAMETERS WHICH INFLUENCE THE  
WALL INTERFERENCE QUANTITIES ARE INDICATED. WALL  
CONFIGURATIONS ARE SHOWN WHICH WILL PRODUCE  
INTERFERENCE-FREE FORCE DATA TO A JET-TO-FREE-STREAM  
VELOCITY RATIO OF 4.8. (AUTHOR)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-724 124 1/3  
MISSISSIPPI STATE UNIV STATE COLLEGE DEPT OF AEROPHYSICS  
AND AEROSPACE ENGINEERING

XV-11A FLIGHT TEST PROGRAM. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
FEB 71 118P MERTAUGH, L. J. ROBERTS, S.  
C. KIRAN, N. S. ;  
REPT. NO. AASE-69-7  
CONTRACT: DA-44-177-AMC-266(T)  
PROJ: DA-1-F-162203-A-142  
TASK: 1-F-162203-A-142-03  
MONITOR: USAAVLABS TR-70-37

UNCLASSIFIED REPORT

DESCRIPTORS: (SHORT TAKE-OFF PLANES, FLIGHT  
TESTING), (RESEARCH PLANES, FLIGHT TESTING),  
BOUNDARY LAYER CONTROL, THRUST AUGMENTATION,  
SHROUDED PROPELLERS, CAMBER, WINGS (U)  
IDENTIFIERS: XV-11A AIRCRAFT, V-11 AIRCRAFT (U)

THE REPORT PRESENTS THE RESULTS OF A TEST PROGRAM  
THAT WAS CONDUCTED TO EVALUATE THE PERFORMANCE AND  
STABILITY AND CONTROL CHARACTERISTICS OF THE XV-  
11A AIRCRAFT. THE AIRCRAFT IS A RESEARCH VEHICLE  
DESIGNED TO PERFORM BASIC AERODYNAMIC FLIGHT RESEARCH  
IN THE AREAS OF HIGH-LIFT BOUNDARY LAYER CONTROL,  
PROPELLER THRUST AUGMENTATION, LOW DRAG GEOMETRY, AND  
STOL AIRCRAFT HANDLING QUALITIES. THE AIRCRAFT  
INCORPORATES A NUMBER OF UNIQUE DESIGN FEATURES  
INCLUDING GLASS FIBER REINFORCED PLASTIC  
CONSTRUCTION; A DISTRIBUTED-SUCTION, HIGH-LIFT  
BOUNDARY LAYER CONTROL SYSTEM; A VARIABLE-CAMBER  
WING; AND A SHROUDED PROPELLER. THE TEST DATA SHOW  
THAT THE AIRCRAFT HAS SUFFICIENT PERFORMANCE AND  
STABILITY AND CONTROL FOR CONDUCTING LOW-SPEED  
AERODYNAMIC RESEARCH. HANDLING QUALITIES RESEARCH  
WOULD BE LIMITED BY THE HIGH LONGITUDINAL AND  
DIRECTIONAL CONTROL FORCE GRADIENTS. ALTHOUGH LOW  
STALL SPEEDS ARE DEMONSTRATED, THE INCREMENT IN LIFT  
DUE TO THE BOUNDARY LAYER CONTROL SYSTEM IS LESS THAN  
ANTICIPATED. AIRCRAFT PERFORMANCE IS SOMEWHAT  
LIMITED BY PROPELLER DEFICIENCIES DUE TO HIGH BLADE  
LOADING. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-724 145 1/3 20/1  
AIR FORCE AERO PROPULSION LAB WRIGHT-PATTERSON AFB  
OHIO

PERFORMANCE AND ACOUSTIC TESTING OF A  
VARIABLE CAMBER PROPELLER. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT. MAR-JUL 70,  
FEB 71 99P MCERLEAN, DONALD P. ;  
EDWARDS, DONALD E. ;  
REPT. NO. AFAPL-TR-7U-80  
PROJ: AF-3066  
TASK: 306612

UNCLASSIFIED REPORT

DESCRIPTORS: (\*PROPELLER BLADES, DESIGN),  
(\*SHORT TAKE-OFF PLANES, \*PROPELLER NOISE),  
CAMBER, MODEL TESTS, FLAPS, TRAILING EDGE,  
AERODYNAMIC CONFIGURATIONS, TEST FACILITIES,  
ACOUSTIC PROPERTIES, AERODYNAMIC CHARACTERISTICS (U)  
IDENTIFIERS: \*VARIABLE CAMBER PROPELLERS, NOISE  
POLLUTION, COMPUTER ANALYSIS (U)

THE REPORT PRESENTS THE TEST RESULTS OBTAINED FROM  
A SERIES OF PERFORMANCE AND ACOUSTIC NEAR-FIELD  
MEASUREMENTS ON A PROPELLER FITTED WITH A VARIABLE  
CAMBER FEATURE. THE SUBJECT PROPELLER EFFECTS A  
CHANGE IN CAMBER BY DEFLECTING A FLAP POSITIONED  
ALONG THE 72% CHORDAL LINE OF EACH BLADE. THE  
TESTS WERE CONDUCTED ON A 10,000 HORSEPOWER ELECTRIC  
WHIRL RIG. THE TESTS REPRESENT THE ONLY TEST DATA  
AVAILABLE ON THIS UNIQUE PROPELLER CONFIGURATION  
WHICH IS CONSIDERED TO HAVE GOOD POTENTIAL FOR V/  
STOL APPLICATIONS. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-724 185 1/3 1/1  
BOEING CO PHILADELPHIA PA VERTOL DIV

STOL HIGH-LIFT DESIGN STUDY, VOLUME 1.  
STATE-OF-THE-ART REVIEW OF STOL AERODYNAMIC  
TECHNOLOGY. (U)

DESCRIPTIVE NOTE: FINAL REPT. JAN-DEC 70,  
APR 71 205P MAY, FRED WIDDISON, COLIN  
A. I  
REPT. NO. D210-10201-1  
CONTRACT: F33615-70-C-1277  
MONITOR: AFFDL TR-71-26-VOL-1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME 2, AD-724 186.

DESCRIPTORS: (\*SHORT TAKE-OFF PLANES,  
\*AERODYNAMICS), STATE-OF-THE-ART REVIEWS, LIFT,  
DESIGN, FLAPS, PITCH(MOTION), PROPULSION,  
MATHEMATICAL PREDICTION (U)  
IDENTIFIERS: SLIPSTREAM (U)

THE STATE OF THE ART OF STOL AERODYNAMIC  
TECHNOLOGY FOR SELECTED LIFT/PROPULSION CONCEPTS WAS  
SURVEYED TO IDENTIFY THE AVAILABLE TEST DATA AND  
PREDICTION METHODS IN THE LITERATURE. THE REPORT  
CONSISTS OF TWO VOLUMES. IN VOLUME 1 IMPORTANT  
AREAS OF TECHNOLOGY AND INFORMATION NECESSARY FOR THE  
EVALUATION OF STOL AIRCRAFT AERODYNAMICS ARE  
LISTED; THE AERODYNAMIC TEST DATA AND PREDICTION  
METHODOLOGY RELEVANT TO THE DEFLECTED SLIPSTREAM AND  
EXTERNALLY BLOWN FLAP CONCEPTS ARE ASSESSED, WITH  
EMPHASIS ON THE LATTER; AN EMPIRICAL METHOD FOR THE  
PREDICTION OF THE LONGITUDINAL AERODYNAMIC  
CHARACTERISTICS OF EXTERNALLY BLOWN FLAP  
CONFIGURATIONS IS PRESENTED; AND HIGH-LIFT TECHNOLOGY  
FOR FIVE LIFT/PROPULSION CONCEPTS IS ASSESSED IN  
APPLICATION TO A MEDIUM-SIZED STOL TRANSPORT.  
(AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-724 186 1/3 1/1  
BOEING CO PHILADELPHIA PA VERTOL DIV

STOL HIGH-LIFT DESIGN STUDY. VOLUME 11.  
BIBLIOGRAPHY.

(U)

DESCRIPTIVE NOTE: FINAL REPT. JAN-DEC 70,  
APR 71 338P MAY, FRED WIDDISON, COLIN

A. i  
REPT. NO. D210-10201-2  
CONTRACT: F33615-70-C-1277  
MONITOR: AFFDL TR-71-26-VOL-2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME 1, AD-724 185.

DESCRIPTORS: (\*SHORT TAKE-OFF PLANES,  
\*AERODYNAMICS), (\*BIBLIOGRAPHIES, SHORT TAKE-OFF  
PLANES), LIFT, FLAPS, PROPULSION, FANS, TILT  
WINGS, ABSTRACTS

(U)

THE VOLUME CONSISTS OF A BIBLIOGRAPHY THAT RESULTED  
FROM A LITERATURE SEARCH FOR AERODYNAMIC INFORMATION  
RELATED TO SEVEN LIFT/PROPULSION CONCEPTS SUITABLE  
FOR STOL AIRCRAFT. THE BIBLIOGRAPHY CONTAINS  
REFERENCES TO APPROXIMATELY 900 REPORTS CLASSIFIED BY  
CONCEPT AND BY TECHNOLOGICAL AREA. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-725 705 17/7  
EPSCO INC WESTWOOD MASS

STOL AIRCRAFT INSTRUMENT LANDING SYSTEM.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,

FEB 71 66P HILLS, ROBERT S. ;

CONTRACT: DOT-FA-69-WA-2098

PROJ: FAA-320-114-02N

MONITOR: FAA-RD 71-17

UNCLASSIFIED REPORT

DESCRIPTORS: (\*INSTRUMENT LANDINGS, \*MICROWAVE EQUIPMENT), (\*SHORT TAKE-OFF PLANES, INSTRUMENT LANDINGS), RADIO SCANNING, AIRPORTS, AZIMUTH, GLIDE PATH SYSTEMS, DISTANCE-MEASURING EQUIPMENT

(U)

IDENTIFIERS: MODILS(MODULAR MICROWAVE INSTRUMENT LANDING SYSTEMS), \*MODULAR MICROWAVE INSTRUMENT LANDING SYSTEMS

(U)

THE REPORT DESCRIBES THE DEVELOPMENT OF A MICROWAVE SCANNING BEAM INSTRUMENT LANDING SYSTEM FOR STOL AIRCRAFT AND AIRPORTS (MODILS). IT IS A FLEXIBLE SYSTEM MEETING OR EXCEEDING CATEGORY I REQUIREMENTS WITH A GROWTH POTENTIAL FOR HANDLING ALL TYPES OF AIRCRAFT IN CATEGORIES II AND III BY MODULAR ADDITIONS. IN AZIMUTH IT PROVIDES PLUS OR MINUS 0.5 DEGREE ACCURACY WITH PILOT SELECTED COURSE WIDTH BETWEEN PLUS OR MINUS 2 DEGREES AND PLUS OR MINUS 10 DEGREES WITHIN A 60 DEGREE COURSE SECTOR. A LEFT OR RIGHT SKEW COURSE, AS WELL AS A CENTERLINE COURSE IS SELECTABLE. IN ELEVATION IT PROVIDES PLUS OR MINUS 0.1 DEGREE ACCURACY OF A PILOT SELECTED GLIDE SLOPE BETWEEN 3 DEGREES AND 12 DEGREES AND PATH WIDTH OF PLUS OR MINUS 1 TO PLUS OR MINUS 5 DEGREES. INTEGRAL DME FUNCTIONS ARE PROVIDED WITH AN ACCURACY OF PLUS OR MINUS 0.01 NAUTICAL MILES PLUS OR MINUS 1% OF RANGE TO A RANGE OF APPROXIMATELY 10 NAUTICAL MILES. THE GROUND STATION IS ENTIRELY DUALISTIC EXCEPT FOR ANTENNAS. SWITCH-OVER FROM MAIN TO STANDBY EQUIPMENT IS CONTROLLED BY INTEGRAL DUAL MONITOR UNITS OPERATING IN PARALLEL. (AUTHOR)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-725 746 1/3  
CORNELL AERONAUTICAL LAB INC BUFFALO N Y

THE GENERATION OF A MILITARY SPECIFICATION  
FOR FLYING QUALITIES OF PILOTED V/STOL  
AIRCRAFT-MIL-F-83300.

(U)

DESCRIPTIVE NOTE: FINAL REPT. APR 66-MAR 71,  
APR 71 41P KEY, DAVID L. I  
REPT. NO. CAL-BB-2925-F-1  
CONTRACT: AF 33(615)-3736, F33615-70-C-1322  
PROJ: AF-648DC  
MONITOR: AFFDL TR-71-23

UNCLASSIFIED REPORT

DESCRIPTORS: (\*VERTICAL TAKE-OFF PLANES,  
SPECIFICATIONS), (\*SHORT TAKE-OFF PLANES,  
SPECIFICATIONS), PERFORMANCE(ENGINEERING),  
FLIGHT CONTROL SYSTEMS, STABILITY

(U)

THE DOCUMENT DESCRIBES A FOUR YEAR EFFORT WHICH LED  
TO THE ADOPTION OF A NEW MILITARY SPECIFICATION  
MIL-F-83300, \*FLYING QUALITIES OF PILOTED  
V/STOL AIRCRAFT, AND THE PUBLICATION OF A  
SUPPORTING DOCUMENT, \*BACKGROUND INFORMATION AND  
USER GUIDE FOR MIL-F-83300, MILITARY  
SPECIFICATION - FLYING QUALITIES OF PILOTED  
V/STOL AIRCRAFT (AFFDL-TR-70-88);  
INCLUDED IN THE REPORT IS AN ASSESSMENT OF THE  
STATUS OF V/STOL FLYING QUALITIES RESEARCH AND  
RECOMMENDATIONS FOR FUTURE WORK. (AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-726 596 21/8 20/4 1/3  
FLIGHT DYNAMICS RESEARCH CORP BURBANK CALIF

A JET FLAP DIFFUSER EJECTOR.

(U)

DESCRIPTIVE NOTE: FINAL REPT. JUN 70-MAY 71,  
JUN 71 158P ALPERIN, MORTON MARLOTTE,  
GARY L. I  
REPT. NO. TR-71-06-01  
CONTRACT: F33615-70-C-1656  
PROJ: AF-1366  
MONITOR: AFFDL TR-71-66

UNCLASSIFIED REPORT

DESCRIPTORS: (•JET PUMPS, COANDA EFFECT),  
(•SHORT TAKE-OFF PLANES, THRUST AUGMENTATION),  
VERTICAL TAKE-OFF PLANES, JET FLAPS, DIFFUSERS,  
KINETIC ENERGY, PRESSURE, TEST METHODS,  
MATHEMATICAL MODELS  
IDENTIFIERS: EJECTORS

(U)

(U)

THE USE OF A JET FLAP DIFFUSER FOR RECOVERY OF  
EJECTOR JET KINETIC ENERGY HAS BEEN INVESTIGATED IN A  
TWO-DIMENSIONAL EXPERIMENT, UTILIZING AN EJECTOR  
WHICH EMPLOYS A COANDA INLET FOR NINETY DEGREE  
ROTATION OF THE PRIMARY FLOW. PERFORMANCE IS  
COMPARED TO A SOLID DIFFUSER EJECTOR OF THE  
EQUIVALENT POWER AND CHANNEL WIDTH. THE JET FLAP  
DIFFUSER EJECTOR APPEARS TO HAVE AN ADVANTAGE OVER  
SOLID DIFFUSER EJECTORS FOR THE RAPID APPLICATION OF  
ADDITIONAL THRUST FOR CONTROL PURPOSES, AS WELL AS  
FOR THE UTILIZATION OF ENGINE POWER IN THE PRODUCTION  
OF PROPULSIVE ENERGY. (AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-726 962 20/1  
WYLE LABS ROCKVILLE MD

EFFECTIVE PERCEIVED NOISE LEVEL EVALUATED  
FOR STOL AND OTHER AIRCRAFT SOUNDS.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,  
MAY 70 118P ADCOCK, B. D. COLLERHEAD, J.  
B. ;  
REPT. NO. WR-70-9  
CONTRACT: FA-67-WA-1731  
MONITOR: FAA-NO 70-5

UNCLASSIFIED REPORT

DESCRIPTORS: (•AIRPLANE NOISE, •AUDITORY  
PERCEPTION), (•SHORT TAKE-OFF PLANES, AIRPLANE  
NOISE), AIRCRAFT ENGINES

(U)

A PAIRED COMPARISON EXPERIMENT WAS CONDUCTED IN WHICH A GROUP OF THIRTY TWO SUBJECTS EVALUATED, IN A PROGRESSIVE WAVE FIELD, THE NOISINESS OF SIXTY RECORDED AIRCRAFT FLYOVER SOUNDS. THIRTY OF THESE RECORDINGS WERE FROM SHORT TAKE-OFF AND LANDING (STOL) AIRCRAFT. THE COMPLETE SET INCLUDED A WIDE RANGE OF TURBOFAN, TURBOJET, PISTON ENGINE AND TURBOPROP POWERED AIRCRAFT IN A VARIETY OF CATEGORIES. THE RESULTS WERE ANALYZED TO TEST THE ABILITY OF THE EFFECTIVE PERCEIVED NOISE LEVEL (EPNL) AND OTHER SCALES TO PREDICT THE SUBJECTIVE RESPONSES. BECAUSE THE SAMPLE OF AIRCRAFT SOUNDS WAS UNUSUALLY LARGE IN NUMBER, VARIETY, DYNAMIC RANGE AND DURATION, THE TEST WAS CONSIDERED TO BE SEVERE. THE MAIN CONCLUSION OF THE STUDY IS THAT THE EPNL PROCEDURE PERFORMS AS WELL FOR THE STOL SOUNDS AS IT DOES FOR THE CTOL (CONVENTIONAL TAKE-OFF AND LANDING AIRCRAFT) SOUNDS AND MAY THUS BE USED WITH EQUAL CONFIDENCE FOR RATING THE SOUNDS OF AIRCRAFT IN BOTH CLASSES. WHEN THE SOUNDS WERE DIVIDED INTO PROPULSION SYSTEM CATEGORIES IT WAS FOUND THAT EPNL, IN COMMON WITH OTHER SCALES, PERFORMED MOST CONSISTENTLY FOR JETS, PISTON ENGINE AIRCRAFT AND TURBOPROPS, IN THAT ORDER. IN GENERAL, THE INTEGRATED DURATION CORRECTION PROVED SUPERIOR TO AN APPROXIMATE CORRECTION BASED ON THE 10 DB-DOWN DURATION. ANALYSIS OF THE RESULTS SHOWED THAT THE AVERAGE MAGNITUDE OF THE TONE-CORRECTION WAS MORE THAN 3 DB AND THAT CORRECTIONS WERE AUTOMATICALLY APPLIED IN PRACTICALLY ALL CASES.

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-728 948 1/3  
DEUTSCHE FORSCHUNGSANSTALT FUER LUFT- UND RAUMFAHRT E V  
BRUNSWICK (WEST GERMANY) INSTITUT FUER STRAHLANTRIEBE

STRAHLDEFLEXION ZUR S/VTOL-  
SCHUBVEKTORSTEUERUNG (JET DEFLECTION FOR S/  
VTOL THRUST VECTOR CONTROL), (U)

62 19P GRASMANN, KURT I  
REPT. NO. DFL-224

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN JAHRBUCH WGLR P381-398  
1962. NO COPIES FURNISHED BY DDC OR NTIS.

SUPPLEMENTARY NOTE: TEXT IN GERMAN; SUMMARIES IN  
ENGLISH AND FRENCH.

DESCRIPTORS: (\*SHORT TAKE-OFF PLANES, LIFT),  
(\*VERTICAL TAKE-OFF PLANES, \*THRUST VECTOR CONTROL  
SYSTEMS), ATTITUDE CONTROL SYSTEMS, STABILIZATION,  
CONTROL, EFFICIENCY, WEST GERMANY (U)  
IDENTIFIERS: \*THRUST DEFLECTORS (U)

THE AUTHOR REPORTS ON INVESTIGATIONS ON THE ECONOMY  
OF THRUST DEFLECTORS USED TO CONTROL THE THRUST  
VECTOR OF S/VTOL AIRCRAFT. FIRST, THE SYSTEM OF  
JET DEFLECTION IS ANALYZED. FUNDAMENTAL  
REQUIREMENTS ARE THEN FORMULATED AND FACTORS OF  
EFFICIENCY, SUCH AS THRUST COEFFICIENT AND PRESSURE  
LOSS COEFFICIENT, ARE DEFINED. THE SECOND PART  
DEALS WITH DETAILS OF THE SPECIAL TECHNIQUE OF JET  
DEFLECTION TESTS, AND COMMUNICATES RESULTS OBTAINED  
FROM THESE TESTS ON DIFFERENT DEFLECTION SYSTEMS.  
SOME ESSENTIAL DIRECTIVES TO APPRECIATE AND  
AMELIORATE THRUST DEFLECTORS HAVE ALREADY BEEN  
OBTAINED. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-729 184 1/3 20/1  
TACTICAL AIR COMMAND LANGLEY AFB VA OFFICE OF OPERATIONS  
ANALYSIS

STOL TRANSPORT PARAMETERS (MILITARY AND  
COMMERCIAL) WITH SPECIAL EMPHASIS ON  
NOISE.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
MAY 71 144P STICKLE, GEORGE W. BATTEN,  
BOBBY G. ;  
REPT. NO. TAC-OA-TR-70-17

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SHORT TAKE-OFF PLANES, \*AIRPLANE  
NOISE); (\*TRANSPORT PLANES, AIRPLANE NOISE),  
LAW, REDUCTION, ATTENUATION, TURBOFAN ENGINES,  
JET ENGINE NOISE, PROPELLER NOISE, GAS TURBINES,  
COMMERCIAL PLANES, AIR POLLUTION (U)  
IDENTIFIERS: NOISE REDUCTION, NOISE POLLUTION (U)

A SHORT HANDBOOK APPROACH RELATING PHYSICAL AND  
ENVIRONMENTAL SELECTION PARAMETERS TO STOL  
TRANSPORT CAPABILITY IS PROVIDED. IT REVIEWS  
EXISTING LAWS AND REGULATIONS ON TRANSPORT NOISE  
ABATEMENT. IT REVIEWS THE NOISE FROM TURBOFAN  
POWERED TRANSPORTS AND DISCUSSES THE FUTURE RESEARCH  
AND DEVELOPMENT TRENDS AND NEEDS. IT PROVIDES AN  
INDEPTH ANALYSIS OF FREE TURBINE TURBOPROPELLER NOISE  
ABATEMENT PROVIDING ENGINEERING FORMULAS, EXAMPLES,  
AND EXPERIMENTAL DATA. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-730 121 1/3 20/4  
CORNELL AERONAUTICAL LAB INC BUFFALO N Y

DEVELOPMENT OF ADVANCED TECHNIQUES FOR THE  
IDENTIFICATION OF V/STOL AIRCRAFT STABILITY  
AND CONTROL PARAMETERS.

(U)

DESCRIPTIVE NOTE: FINAL REPT. MAY 69-DEC 70,  
AUG 71 359P CHEN, ROBERT T. N. ;  
EULRICH, BERNARD J. ; LEBACQZ, J. VICTOR ;  
REPT. NO. CAL-BM-2620-F-1  
CONTRACT: N00019-69-C-0534

UNCLASSIFIED REPORT

DESCRIPTORS: (•) VERTICAL TAKE-OFF PLANES, AERODYNAMIC  
CHARACTERISTICS), (•) SHORT TAKE-OFF PLANES,  
MATHEMATICAL MODELS), FLIGHT CONTROL SYSTEMS,  
EQUATIONS OF MOTION, FLIGHT PATHS, STABILITY,  
HOVERING, ALGORITHMS  
IDENTIFIERS: • TRANSITION FLIGHT, KALMAN FILTERS,  
X-22 AIRCRAFT

(U)

(U)

CONTEMPORARY ANALYSES OF TRANSITION FLIGHT OF V/  
STOL AIRCRAFT ARE BASED ON AERODYNAMIC DATA  
MEASURED IN A WIND TUNNEL OR ON ANALYTICAL PREDICTION  
USING METHODS DEVELOPED FOR CONVENTIONAL AIRCRAFT.  
THE VALIDITY AND ACCURACY OF THESE TECHNIQUES FOR  
V/STOL AIRCRAFT HAS NOT YET BEEN ESTABLISHED, AND  
IT IS ESSENTIAL THAT THEY BE CORRELATED WITH FLIGHT  
TEST DATA THROUGH PARAMETER IDENTIFICATION. IN  
SPITE OF THE COMPLICATED NATURE OF V/STOL  
DYNAMICS IN TRANSITION, SOME METHOD OF IDENTIFYING  
THESE CHARACTERISTICS IS REQUIRED. THIS REPORT  
DOCUMENTS THE DEVELOPMENT OF IDENTIFICATION  
TECHNIQUES TO MEET THIS REQUIREMENT. THE REPORT  
FIRST PRESENTS THE SELECTION OF A MATHEMATICAL MODEL  
TO REPRESENT A V/STOL AIRCRAFT (THE X-22A).  
THIS IS FOLLOWED BY A DISCUSSION OF AVAILABLE  
IDENTIFICATION TECHNIQUES. BASED UPON A THOROUGH  
KNOWLEDGE OF THE REQUIREMENTS OF THIS PROGRAM AND THE  
LIMITATIONS OF THE AVAILABLE TECHNIQUES, ADVANCED  
TECHNIQUES SUITABLE FOR IDENTIFICATION OF V/STOL  
AIRCRAFT STABILITY AND CONTROL PARAMETERS ARE  
DEVELOPED. (AUTHOR)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-730 571 1/3  
HONEYWELL INC ST PAUL MINN RESEARCH DEPT

CONCEPTUAL STUDY TO APPLY ADVANCED FLIGHT  
CONTROL TECHNOLOGY TO THE COIN OR TRIM  
AIRCRAFT.

(U)

DESCRIPTIVE NOTE: FINAL REPT. 1 JUL 70-3 FEB 71,  
JUN 71 151P SMITH, G. A. HAMMER, J.  
M. ROSE, R. E. ;  
REPT. NO. 12225-FR(R)  
CONTRACT: N00019-70-C-0349

UNCLASSIFIED REPORT

DESCRIPTORS: (SHORT TAKE-OFF PLANES, FLIGHT  
CONTROL SYSTEMS), JETS, AIRPLANE MODELS, WINGS,  
WIND TUNNEL MODELS, LIFT, DRAG, AIRFOILS,  
EXPERIMENTAL DATA

(U)

IDENTIFIERS: TRIM (TRAILS ROADS INTERDICTION  
MISSIONS), TRAILS ROADS INTERDICTION MISSION,  
TRIM AIRCRAFT, OV-10 AIRCRAFT, OV-10A  
AIRCRAFT, VARIABLE DEFLECTION THRUSTERS

(U)

INVESTIGATIONS OF THE VARIABLE DEFLECTION  
THRUSTER (VDT) FOR A NON-EXTERNAL-MOVING SURFACES  
(NEMS) FLIGHT CONTROL SYSTEM HAVE BEEN EXTENDED TO  
DETERMINE THE EFFECTS OF FINITE ASPECT RATIO AND  
PART-SPAN BLOWING AT SUBSONIC SPEEDS. WIND TUNNEL  
TESTS HAVE REVEALED THAT FULL-SPAN BLOWING IS MORE  
EFFECTIVE THAN PART-SPAN BLOWING FOR OBTAINING LIFT  
OR ROLLING MOMENTS. IT WAS ALSO SHOWN THAT THE  
'LIFT EFFECTIVENESS' DECREASES WHEN THE RATIO OF  
BLOWN AREA TO WING AREA DECREASES OR WHEN A PART-SPAN  
BLOWN AREA IS MOVED TOWARD THE WING TIP. THE  
RESULTS OF THE WIND TUNNEL STUDY INDICATE THAT  
AVAILABLE THEORETICAL ANALYSES PROVIDE SATISFACTORY  
PREDICTIONS OF JET-FLAP LIFT FOR FULL SPAN BLOWING,  
BUT FURTHER THEORETICAL WORK IS NEEDED, ESPECIALLY TO  
DETERMINE THE EFFECTS OF PART-SPAN BLOWING. A STUDY  
TO EXAMINE THE FEASIBILITY OF USING VDT BLOWING FOR  
PRIMARY FLIGHT CONTROL OF COIN (COUNTERINSURGENCY  
OR TRIM (TRAILS, ROADS AND INTERDICTION MISSIONS)  
AIRCRAFT WAS UNDERTAKEN. THE ESTIMATES OF THE  
REQUIRED THRUST, MASS FLOW AND HORSEPOWER SEEMED  
REASONABLE, SO DUCT LOSSES WERE CALCULATED, AND THE  
WEIGHT AND FUEL REQUIREMENTS WERE ESTIMATED. A VDT  
PRIMARY FLIGHT CONTROL SYSTEM WEIGHING 480 LB WAS  
HYPOTHESIZED, AND THE MANEUVERING CAPABILITY OF AN  
AIRCRAFT WITH THIS NEMS SYSTEM WAS COMPARED TO THE  
AIRCRAFT WITH CONVENTIONAL CONTROLS.

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-732 570 1/3  
DOUGLAS AIRCRAFT CO LONG BEACH CALIF

A FLIGHT SIMULATOR STUDY OF STOL TRANSPORT  
DIRECTIONAL CONTROL CHARACTERISTICS.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,  
JUN 71 135P BERG, ROBERT A. ; SHIRLEY, W.  
ALLEN ; TEPPER, GARY L. ; CRAIG, SAMUEL J. ;  
CONTRACT: DOT-FA70WA-2395  
MONITOR: FAA-RD 71-81

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SHORT TAKE-OFF PLANES, \*FLIGHT  
CONTROL SYSTEMS), (\*TRANSPORT PLANES, FLIGHT  
CONTROL SYSTEMS), FLIGHT SIMULATORS, ROLL, YAW,  
APPROACH, AIRCRAFT LANDINGS

(U)

A SYSTEMATIC INVESTIGATION WAS CONDUCTED OF STOL  
TRANSPORT TERMINAL AREA DIRECTIONAL CONTROL  
CHARACTERISTICS TO IDENTIFY THE SIGNIFICANT  
CONSIDERATIONS AND TO ESTABLISH APPROPRIATE  
DIRECTIONAL CONTROL CRITERIA. THE INVESTIGATION  
CONSISTED OF AN ANALYSIS OF EXISTING DATA AND A  
MOVING-BASE FLIGHT SIMULATOR PROGRAM USING THE NASA  
AMES RESEARCH CENTER S-16 MOVING CAB  
TRANSPORT SIMULATOR. THE SIMULATOR TEST PROGRAM  
COVERED A BROAD RANGE OF LATERAL AND DIRECTIONAL  
AERODYNAMIC CHARACTERISTICS REPRESENTATIVE OF TYPICAL  
STOL TRANSPORT AIRCRAFT. THIS EFFORT IS THE  
SECOND PHASE OF AN EXTENSIVE STOL SIMULATION  
PROGRAM, THE FIRST PHASE OF WHICH WAS DEVOTED TO THE  
INVESTIGATION OF LATERAL CONTROL CHARACTERISTICS.  
THE PRESENT STUDY REVEALED THE EXISTENCE OF AN  
APPRECIABLE INTERACTION BETWEEN THE ROLL AND THE  
HEADING CONTROL TASKS WHICH SUGGESTS THAT ROLL-MODE  
DAMPING REQUIREMENTS SHOULD BE SPECIFIED IN TERMS OF  
THE HEADING DELAY CHARACTERISTICS. LATERAL CONTROL  
SENSITIVITY TESTS WERE CONDUCTED WHICH CORROBORATED  
THE RESULTS OF THE FIRST PHASE OF THE PROGRAM.  
(AUTHOR)

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UNCLASSIFIED

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-732 681 1/3  
RAND CORP SANTA MONICA CALIF

A MODEL FOR EVALUATING VSTOL VERSUS CTOL  
COMBAT AIRCRAFT SYSTEMS,

(U)

MAR 71 30P HOROWITZ, SEYMOUR ; SHISHKO,  
ROBERT ;  
REPT. NO. P-4587

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH FEDERAL  
AVIATION ADMINISTRATION, WASHINGTON, D. C. AND  
YALE UNIV., NEW HAVEN, CONN.

DESCRIPTORS: (SHORT TAKE-OFF PLANES,  
OPTIMIZATION), COST EFFECTIVENESS, MATHEMATICAL  
MODELS, EFFECTIVENESS, PROBABILITY, SYSTEMS  
ENGINEERING

(U)

IDENTIFIERS: COST MODELS

(U)

THE PAPER DESCRIBES A COST-EFFECTIVENESS STUDY OF  
THE USE OF VERTICAL OR SHORT TAKEOFF AND LANDING  
(VSTOL) AIRCRAFT FOR COMBAT MISSIONS. A  
COMPARISON IS MADE WITH CONVENTIONAL (CTOL)  
AIRCRAFT AS TACTICAL FIGHTERS IN A FUTURE NATO  
ENVIRONMENT. A MODEL YIELDING THE PROBABILITY OF  
COMPLETING N SUCCESSIVE MISSIONS IS USED AS A MEASURE  
OF COMBAT EFFECTIVENESS. A COST MODEL WAS  
CONSTRUCTED TO REFLECT THE RESOURCE IMPACT OF THE  
SAME VARIABLES OR ALTERNATIVES THAT AFFECT THE  
MEASURE OF EFFECTIVENESS. (AUTHOR)

(U)

UNCLASSIFIED

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-732 842 13/11 1/3  
AEROSPACE RESEARCH LABS WRIGHT-PATTERSON AFB OHIO

WHY EJECTORS FOR AIRCRAFT PROPULSION-LIFT  
SYSTEMS AND WHERE WE STAND.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,  
AUG 71 41P FANCHER, RICHARD B. ;  
REPT. NO. ARL-71-0140  
PROJ: AF-7116

UNCLASSIFIED REPORT

DESCRIPTORS: (•JET PUMPS,  
PERFORMANCE(ENGINEERING)), (•SHORT TAKE-OFF  
PLANES, •THRUST AUGMENTATION), NOZZLE AREA RATIO,  
DIFFUSERS, LIFT, THRUST AUGMENTOR NOZZLES, JET  
MIXING FLOW, EXPERIMENTAL DATA  
IDENTIFIERS: EVALUATION

(U)

(U)

THE THRUST AUGMENTATION, LIFT AUGMENTATION AND  
NOISE REDUCTION CHARACTERISTICS OF COMPACT EJECTORS  
MAKE THEM POTENTIALLY ATTRACTIVE FOR PROPULSION LIFT  
SYSTEMS; HOWEVER IN THE PAST, POOR THRUST  
AUGMENTATION RESULTS HAVE NEGATED THE OTHER BENEFITS.  
THIS REPORT COVERS THE GENERAL CHARACTERISTICS OF  
EJECTORS POINTING OUT WHAT MAKES THEM ATTRACTIVE AND  
WHY ONLY CERTAIN TYPES OF EJECTORS ARE OF INTEREST.  
IT REVIEWS THE KEY REQUIREMENTS FOR HIGH  
PERFORMANCE THRUST AUGMENTATION. IT ALSO PRESENTS  
A SUMMARY OF THE PERFORMANCE RESULTS ACHIEVED THUS  
FAR AND PROPOSES SOME POSSIBLE APPLICATIONS FOR  
VARIOUS TYPES OF V/STOL AIRCRAFT. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-733 185 1777  
NAVAL POSTGRADUATE SCHOOL MONTEREY CALIF

DETERMINATION OF STOL AIR TERMINAL TRAFFIC  
CAPACITY THROUGH USE OF COMPUTER  
SIMULATION. (U)

DESCRIPTIVE NOTE: MASTER'S THESIS,  
SEP 71 68P RINKER, ROBERT EVANS ;

UNCLASSIFIED REPORT

DESCRIPTORS: (AIR TRAFFIC CONTROL SYSTEMS,  
PROGRAMMING (COMPUTERS)), (SHORT TAKE-OFF  
PLANES, TERMINAL FLIGHT FACILITIES), AIR TRAFFIC  
CONTROL TERMINAL AREAS, AIRCRAFT LANDINGS, TAKE-OFF,  
TIME STUDIES, CONTROL SEQUENCES, MATHEMATICAL  
MODELS, COMPUTER PROGRAMS, THESES (U)  
IDENTIFIERS: COMPUTERIZED SIMULATION (U)

THE CAPACITY OF AN AIR TERMINAL FOR SHORT  
TAKEOFF AND LANDING AIRCRAFT IS ANALYZED. THE  
TERMINAL IS CONSIDERED TO BE OPERATING AS PART OF AN  
INTRA-URBAN AIR RAPID TRANSIT SYSTEM. THE AIR  
TRAFFIC FLOW THROUGH THE TERMINAL IS MODELED BY A  
COMPUTER SIMULATION WRITTEN IN BOTH THE FORTRAN IV  
AND GPSS LANGUAGES. THE MODEL IS USED TO SOLVE  
THE TRAFFIC CAPACITY PROBLEM UNDER TWO SETS OF  
TRAFFIC CONTROL RULES. IN THE FIRST CASE, EXISTING  
FAA RULES, WHICH REQUIRE 3 MILES SEPARATION BETWEEN  
ARRIVALS AND 2 MILES BETWEEN AN ARRIVAL AND A  
DEPARTURE, ARE USED. IN A SECOND CASE, THE RULES  
ARE 2 MILES BETWEEN ARRIVALS AND 1 MILE BETWEEN AN  
ARRIVAL AND A DEPARTURE. A DETAILED DESCRIPTION OF  
THE MODEL IS PRESENTED SO THAT OTHERS MIGHT USE THE  
MODEL. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-733 756 1/3  
TRANSPORTATION SYSTEMS CENTER CAMBRIDGE MASS

LINEARIZED MATHEMATICAL MODELS FOR DE  
HAVILLAND CANADA 'BUFFALO AND TWIN OTTER'  
STOL TRANSPORTS.

(U)

DESCRIPTIVE NOTE: TECHNICAL NOTE;  
JUN 71 112P MACDONALD, R. A. ; GARELICK,  
MEL ; O'GRADY, J. ;  
REPT. NO. TSC-FAA-71-8

UNCLASSIFIED REPORT

DESCRIPTORS: (•SHORT TAKE-OFF PLANES, STABILITY),  
MATHEMATICAL MODELS, CONTROL SURFACES, LIFT,  
DRAG, EQUATIONS OF MOTION, PERTURBATION THEORY,  
AIR TRAFFIC CONTROL SYSTEMS  
IDENTIFIERS: DHC-5 AIRCRAFT, DHC-6 AIRCRAFT, SIX  
DEGREES OF FREEDOM

(U)

(U)

LINEARIZED SIX DEGREE OF FREEDOM RIGID BODY  
AIRCRAFT EQUATIONS OF MOTION ARE PRESENTED IN A  
STABILITY AXES SYSTEM. VALUES OF STABILITY  
DERIVATIVES ARE ESTIMATED FOR TWO REPRESENTATIVE  
STOL AIRCRAFT - THE DEHAVILLAND OF CANADA  
'BUFFALO' AND 'TWIN OTTER.' THESE ESTIMATES  
ARE BASED ON ANALYTICAL EXPRESSIONS INCLUDED IN THE  
REPORT. THE COMBINATION OF THE EQUATIONS OF MOTION  
AND THE ESTIMATED STABILITY DERIVATIVES PROVIDES AN  
AIRCRAFT MODEL WHICH IS USEFUL FOR NAVIGATION,  
GUIDANCE AND ATC STUDIES. RESULTING  
TRANSIENT RESPONSES TO CONTROL INPUTS ARE PRESENTED.

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UNCLASSIFIED

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-735 399 17/7 1/3  
NATIONAL AVIATION FACILITIES EXPERIMENTAL CENTER ATLANTIC  
CITY N J

ANALYTICAL STUDY OF THE ADEQUACY OF VOR/DME  
AND DME/DME GUIDANCE SIGNALS FOR V/STOL  
AREA NAVIGATION IN THE LOS ANGELES AREA. (U)

DESCRIPTIVE NOTE: INTERIM REPT. JUL 70-JUN 71,  
DEC 71 102P DINERMAN, BERNHART V. 1  
REPT. NO. FAA-NA-71-4B  
PROJ: FAA-045-390-UIX, FAA-330-014-04X  
MONITOR: FAA-RD 71-96

UNCLASSIFIED REPORT

DESCRIPTORS: (•NAVIGATIONAL AIDS,  
RELIABILITY(ELECTRONICS)), (•SHORT TAKE-OFF  
PLANES, ALL-WEATHER AVIATION), CIVIL AVIATION,  
VERTICAL TAKE-OFF PLANES, TERMINAL FLIGHT  
FACILITIES, DISTANCE-MEASURING EQUIPMENT, FLIGHT  
PATHS, OPTIMIZATION, FEASIBILITY STUDIES,  
CALIFORNIA (U)  
IDENTIFIERS: VOR(VERY HIGH FREQUENCY OMNIRANGE),  
VERY HIGH FREQUENCY OMNIRANGE, EVALUATION (U)

AN ANALYSIS WAS PERFORMED BY PERSONNEL OF THE  
NATIONAL AVIATION FACILITIES EXPERIMENTAL  
CENTER (NAFEC) TO DETERMINE THE ADEQUACY OF VERY  
HIGH FREQUENCY OMNIRANGE/DISTANCE MEASURING EQUIPMENT  
(VOR/DME) GUIDANCE SIGNALS FOR VERTICAL/SHORT  
TAKEOFF AND LANDING (V/STOL) AIRCRAFT AREA  
NAVIGATION (RNAV) IN THE LOS ANGELES (LAX)  
AREA. GUIDANCE SIGNALS WERE DERIVED FROM EXISTING  
VOR/DME AND 'CONVERTED' VOR FACILITIES.  
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-737 752 1/3  
ARMY AIR MOBILITY RESEARCH AND DEVELOPMENT LAB FORT EUSTIS  
VA EUSTIS DIRECTORATE

DYNAMIC RESPONSE OF THE OV-1A AIRCRAFT TO  
SOFT FIELD LANDINGS.

(U)

DESCRIPTIVE NOTE: FINAL REPT. JUL-AUG 67,  
OCT 71 147P ALEXANDER, WILLIAM T. I  
PROJ: DA-1-F-162204-A-146  
TASK: 1-F-162204-A-14602  
MONITOR: USAAMRDL TR-71-62

UNCLASSIFIED REPORT

DESCRIPTORS: (•AIRCRAFT LANDINGS, TERRAIN),  
(•SHORT TAKE-OFF PLANES, AIRCRAFT LANDINGS),  
ROUGHNESS, LANDING IMPACT,  
PROGRAMMING (COMPUTERS), EQUATIONS OF MOTION,  
OBSERVATION PLANES  
IDENTIFIERS: OV-1A AIRCRAFT, V-1 AIRCRAFT

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THE REPORT PRESENTS THE GROUND LOADS MEASURED ON AN  
INSTRUMENTED OV-1 AIRPLANE DURING LANDINGS ON  
SMOOTH AND ROUGH FIELDS. TEST RESULTS FOR THREE  
LANDINGS ARE COMPARED WITH THE RESULTS OF DYNAMIC  
LOADS COMPUTATIONS PERFORMED ON A DIGITAL COMPUTER.  
THE COMPUTING PROGRAM IS ALSO USED TO CALCULATE THE  
LOADS WHICH WOULD HAVE BEEN OBTAINED BY LANDINGS AND  
ROLLOUTS ON THE ROUGHEST PORTIONS OF TWO FIELDS WHOSE  
CONTOURS WERE MEASURED. FAILING LOADS WERE OBTAINED  
ON ONE FIELD ONLY. THE EQUATIONS OF MOTION FOR THE  
COMPUTER PROGRAM ARE PRESENTED. RECOMMENDATIONS  
ARE MADE FOR FUTURE INVESTIGATIONS THAT WILL IMPROVE  
THE ANALYTICAL PROCEDURES. (AUTHOR)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-740 063 17/7  
NATIONAL AVIATION FACILITIES EXPERIMENTAL CENTER ATLANTIC  
CITY N J

EVALUATION OF STOL INSTRUMENT LANDING SYSTEM  
(TALAR IV).

(U)

DESCRIPTIVE NOTE: FINAL REPT. JUL 70-JUL 71,  
APR 72 45P ADAMS, GLEN D. ;  
REPT. NO. FAA-NA-72-27  
PROJ: FAA-320-114-USX  
MONITOR: FAA-RD 72-15

UNCLASSIFIED REPORT

DESCRIPTORS: (RADAR LANDING CONTROL, SHORT TAKE-OFF  
PLANES), AIRCRAFT LANDINGS, K BAND, GLIDE PATH  
SYSTEMS, ACCEPTABILITY, INSTRUMENT LANDINGS

(U)

IDENTIFIERS: \*INSTRUMENT LANDING SYSTEMS, TALAR 4  
RADAR, TALAR (TACTICAL LANDING APPROACH  
RADAR), TACTICAL LANDING APPROACH RADAR

(U)

TALAR IV OPERATES AT 15.5 GHZ (KU-BAND  
MAGNETRON OUTPUT), PROVIDING LOCALIZER AND GLIDE  
SLOPE SIGNALS FOR APPROACH GUIDANCE FOR AIRCRAFT  
EQUIPPED WITH A RECEIVER. THE FAA UNITS WERE  
MODIFIED TO PROVIDE GLIDE SLOPE ANGLES BETWEEN 6  
DEGREES AND 9 DEGREES, TO INCLUDE A TRANSMITTER  
MONITOR, AND TO TRANSMIT AN IDENTIFICATION CODE.  
THE MAGNETRON LIFE IS ABOUT 500 HOURS. THE  
MONITOR IS INADEQUATE BECAUSE OF DRIFT, BUT OVERALL  
THE TALAR HAS BEEN A RELIABLE AND USEFUL TOOL.  
THE GUIDANCE SIGNALS ARE GENERALLY OF GOOD QUALITY.  
THE TRANSMITTER LOCATION, IN RELATION TO THE  
RUNWAY, AFFECTS THE PILOT'S ABILITY TO SET THE  
AIRCRAFT DOWN AT THE DESIRED TOUCHDOWN POINT.  
(AUTHOR)

(U)

UNCLASSIFIED

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-740 476 1/3 20/4 1/1  
DAYTON UNIV OHIO RESEARCH INST

METHOD FOR THE PREDICTION OF PERFORMANCE OF  
STOL HIGH LIFT SYSTEMS NEAR MAXIMUM LIFT  
COEFFICIENT. (U)

DESCRIPTIVE NOTE: FINAL REPT. JAN-SEP 71,  
DEC 71 54P BAUER, PAUL T. ;  
CONTRACT: F33615-70-C-1019  
PROJ: AF-1366  
TASK: 136617  
MONITOR: AFFDL TR-71-169

UNCLASSIFIED REPORT

DESCRIPTORS: (\*LIFT; \*FLOW SEPARATION), (\*SHORT  
TAKE-OFF PLANES; LIFT), MATHEMATICAL PREDICTION,  
TURBULENT BOUNDARY LAYER; FLOW FIELDS;  
MATHEMATICAL MODELS (U)  
IDENTIFIERS: \*MAXIMUM LIFT COEFFICIENT (U)

POTENTIAL FLOW AND BOUNDARY LAYER METHODS ARE  
IDENTIFIED AND DEVELOPED FOR THE ANALYTIC CALCULATION  
OF THE PERFORMANCE OF LIFT SYSTEMS WITH SIGNIFICANT  
FLOW SEPARATION. PARTICULAR EMPHASIS IS GIVEN TO  
THE USE OF THE PRESENTED METHODS IN THE CALCULATION  
OF THE FLOW FIELD FOR A SINGLE AIRFOIL IN  
DEMONSTRATION OF THEIR CAPABILITY. A PROCEDURE FOR  
APPLICATION TO MULTIPLE ELEMENT HIGH LIFT SYSTEMS IS  
INDICATED. SPECIAL CONSIDERATION IS GIVEN TO THE  
REPRESENTATION OF TURBULENT SEPARATING BOUNDARY  
LAYERS AND AN EMPIRICAL COMPUTATIONAL PROCEDURE HAS  
BEEN DEVELOPED WHERE NONE HAD PREVIOUSLY EXISTED.  
THE WORK PRESENTED HEREIN PROVIDES A THOROUGH BASIS  
ON WHICH TO DEVELOP AN ACCURATE COMPUTER SIMULATION  
MODEL OF HIGH LIFT SYSTEMS WITH SIGNIFICANT FLOW  
SEPARATION. (AUTHOR) (U)

UNCLASSIFIED

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UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-742 093 1/5 8/6  
DAYTON UNIV OHIO RESEARCH INST

RUNWAY DISTRIBUTION STUDY (SELECTED COUNTRIES).

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT. SEP 70-SEP 71,  
SEP 71 337P BOEHMER, ROBERT P. I  
REPT. NO. UDRI-TR-71-48  
CONTRACT: F33615-71-C-1075

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-742 096.

DESCRIPTORS: (•LANDING FIELDS, •SHORT TAKE-OFF  
PLANES), (•SOUTHEAST ASIA: LANDING FIELDS),  
(•SOUTH AMERICA, LANDING FIELDS), (•AFRICA,  
LANDING FIELDS), (•EASTERN EUROPE, LANDING  
FIELDS), RUNWAYS, MAPPING, ADVANCED PLANNING,  
POSITION FINDING, TERRAIN INTELLIGENCE  
IDENTIFIERS: FOB(FORWARD OPERATING BASES),  
FORWARD OPERATING BASES, MOB(MAIN OPERATING  
BASES), MAIN OPERATING BASES, COMPUTER AIDED  
ANALYSIS

(U)

(U)

THE PURPOSE OF THIS STUDY WAS TO ESTABLISH THE  
DISTRIBUTION OF MAIN OPERATING BASES (MOB) AND  
FORWARD OPERATING BASES (FOB) WITHIN 44 SELECTED  
COUNTRIES. EACH COUNTRY WAS DIVIDED INTO CELLS OF  
EQUAL AREA AND THE DISTRIBUTIONS OF THE RUNWAYS ARE  
WITH RESPECT TO THE MIDPOINTS OF THE CELLS. THE  
REPORT GRAPHICALLY PRESENTS THE AIRFIELD  
DISTRIBUTIONS GENERATED BY THIS STUDY. THE RESULTS  
ARE TO BE USED IN CONJUNCTION WITH AN AIRLIFT STUDY  
TO DETERMINE THE EFFECTIVENESS OF STOL AND VTOL  
AIRCRAFT. (AUTHOR)

(U)

UNCLASSIFIED

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UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-742 096 1/5 8/6  
DAYTON UNIV OHIO RESEARCH INST

RUNWAY DISTRIBUTION STUDY (EUROPEAN COUNTRIES).

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
APR 72 173P BOEHMER, ROBERT P. ;  
REPT. NO, UDR1-TR-72-22  
CONTRACT: F33615-72-C-1049

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-742 093.

DESCRIPTORS: (•LANDING FIELDS, •WESTERN EUROPE),  
(•SHORT TAKE-OFF PLANES, LANDING FIELDS),  
RUNWAYS, MAPPING, ADVANCED PLANNING, POSITION  
FINDING, TERRAIN INTELLIGENCE

(U)

IDENTIFIERS: FOB(FORWARD OPERATING BASES),  
FORWARD OPERATING BASES, MOB(MAIN OPERATING  
BASES); MAIN OPERATING BASES, COMPUTER AIDED  
ANALYSIS

(U)

THE PURPOSE OF THIS STUDY WAS TO ESTABLISH THE  
DISTRIBUTION OF MAIN OPERATING BASES (MOB) AND  
FORWARD OPERATING BASES (FOB) WITHIN 18 EUROPEAN  
COUNTRIES. EACH COUNTRY WAS DIVIDED INTO CELLS OF  
EQUAL AREA AND THE DISTRIBUTIONS OF THE RUNWAYS ARE  
WITH RESPECT TO THE MIDPOINTS OF THE CELLS. THE  
REPORT GRAPHICALLY PRESENTS THE AIRFIELD  
DISTRIBUTIONS GENERATED BY THIS STUDY. THE RESULTS  
ARE TO BE USED IN CONJUNCTION WITH AN AIRLIFT STUDY  
TO DETERMINE THE EFFECTIVENESS OF STOL AND VTOL  
AIRCRAFT. (AUTHOR)

(U)

UNCLASSIFIED

/ZOM08

UNCLASSIFIED

DCC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-742 314 1/3  
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF  
ENGINEERING

DESIGN OF A LONGITUDINAL FLIGHT CONTROL  
SYSTEM FOR A STOL TRANSPORT IN THE LANDING  
CONFIGURATION.

(U)

DESCRIPTIVE NOTE: MASTER'S THESIS:  
MAR 72 121P HAMILTON, EDWIN L. ;  
REPT. NO. GE/EE/72-13

UNCLASSIFIED REPORT

DESCRIPTORS: (FLIGHT CONTROL SYSTEMS, DESIGN),  
(SHORT TAKE-OFF PLANES, FLIGHT CONTROL SYSTEMS),  
PITCH(MOTION); CONTROL SYSTEMS, STABILITY,  
FLIGHT PATHS, EQUATIONS OF MOTION; AIRCRAFT  
LANDINGS, THESES

(U)

IDENTIFIERS: CONTROL THEORY, COMPUTER AIDED  
ANALYSIS

(U)

THE LONGITUDINAL DYNAMICS OF A MEDIUM STOL  
TRANSPORT ARE STUDIED TO DETERMINE THE AUGMENTATION  
NECESSARY TO PROVIDE AN ACCEPTABLE LONGITUDINAL  
FLIGHT CONTROL SYSTEM, AND A FLIGHT CONTROL SYSTEM IS  
SYNTHESIZED AND EVALUATED. WIND TUNNEL DATA IS  
ANALYZED AND AN OPERATING ENVELOPE IS DEFINED.  
LONGITUDINAL HANDLING QUALITIES OF THE UNAUGMENTED  
AIRCRAFT ARE COMPARED TO AIR FORCE REQUIREMENTS,  
AND DESIGN CRITERIA ARE FORMULATED. A LONGITUDINAL  
FLIGHT CONTROL SYSTEM WHICH UTILIZES PARALLEL  
ACTUATION OF BOTH ELEVATOR AND DIRECT-LIFT CONTROL  
SPOILERS THROUGH MOVEMENT OF THE PILOT'S STICK IS  
SYNTHESIZED USING ROOT LOCUS TECHNIQUES. THE  
SYSTEM IS BASED UPON CONTROL OF THE FLIGHT PATH.  
(AUTHOR)

(U)

UNCLASSIFIED

/ZOM08

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-742 463 13/2 1/3 1/5  
AMERICAN AIRLINES NEW YORK

AIRLINE VIEW OF STOL SYSTEM  
REQUIREMENTS.

(U)

DESCRIPTIVE NOTE: FINAL REPT.

FEB 72 172P

REPT. NO. AAL-ER/D-56

MONITOR: DOT-OS 10075

UNCLASSIFIED REPORT

DESCRIPTORS: (•AIR TRANSPORTATION, ADVANCED  
PLANNING), (•SHORT TAKE-OFF PLANES, •TERMINAL  
FLIGHT FACILITIES), COMMERCIAL PLANES, AIRCRAFT  
LANDINGS, TAKE-OFF, FLIGHT PATHS, COSTS, SITE  
SELECTION, MANAGEMENT PLANNING, DECISION MAKING  
IDENTIFIERS: •MANAGEMENT INFORMATION SYSTEMS

(U)

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CONVENTIONAL AIR AND RAIL SYSTEMS ARE INCAPABLE OF  
PROVIDING NEEDED SHORT-HAUL SERVICE FOR THE INCREASED  
CAPACITY REQUIREMENTS OF THE NEAR FUTURE. SOME  
IMPROVEMENTS CAN BE MADE BUT A NEW, INTEGRATED SHORT-  
HAUL TRANSPORTATION SYSTEM MAY BE NEEDED TO  
SUPPLEMENT THE PRESENT SYSTEM. THE COMPLEXITY AND  
MAGNITUDE OF THE PROBLEM REQUIRE SIGNIFICANT  
LEADERSHIP AND FUNDING BY THE FEDERAL GOVERNMENT.  
THE AIRLINES' AREAS OF CONCERN INCLUDE THE  
AIRCRAFT, STOLPORTS, ATC, MARKETING, SAFETY,  
ECONOMICS, AND ACCEPTANCE BY PASSENGERS AND  
STOLPORT NEIGHBORS. THIS PAPER ADDRESSES REDUCED  
TAKEOFF AND LANDING (RTOL), PROPELLER STOL  
TRANSPORT (PST), JET STOL TRANSPORT (JST),  
ATC, STOLPORT SITING, ROUTE ANALYSIS,  
CERTIFICATION AND SAFETY, AIRLINE SERVICE  
REQUIREMENTS, ECONOMICS, METROFLIGHT DEMONSTRATION  
NEED, STOLPORT ACCEPTANCE, PUBLIC DEMAND  
STIMULATION AND STOL DEVELOPMENT SYSTEM MANAGEMENT.  
(AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-743 257 1/1 20/4  
TORONTO UNIV (ONTARIO) INST FOR AEROSPACE STUDIES

AERODYNAMICS OF WING-SLIPSTREAM  
INTERACTION: A NUMERICAL STUDY,

(U)

SEP 71 86P ELLIS, N. D. I  
REPT. NO. UTIAS-169  
CONTRACT: AF-AFOSR-1885-70  
PROJ: AF-9781  
TASK: 978102  
MONITOR: AFOSR TR-71-3086

UNCLASSIFIED REPORT

DESCRIPTORS: (•THIN WINGS, LIFT), (•SHORT TAKE-  
OFF PLANES, THIN WINGS), FLOW FIELDS, VERTICAL  
TAKE-OFF PLANES, VORTICES, PROPELLERS(AERIAL),  
INTERFERENCE, EQUATIONS OF MOTION, NUMERICAL  
METHODS AND PROCEDURES, PROGRAMMING(COMPUTERS),  
THEORY, EXPERIMENTAL DATA, CANADA  
IDENTIFIERS: •WING SLIPSTREAM INTERACTIONS

(U)

(U)

A FUNDAMENTAL THEORY OF WING-SLIPSTREAM INTERACTION  
ACCOUNTS FOR SLIPSTREAMS OF ARBITRARY CROSS-SECTION  
BY MEANS OF VORTEX SHEATHS. THESE SHEATHS TOGETHER  
WITH THE WING CIRCULATION PATTERN ARE DICTATED BY THE  
BOUNDARY CONDITIONS; THE ANALYSIS LEADS TO  
SIMULTANEOUS INTEGRAL EQUATIONS FOR THEIR  
DETERMINATION. IN A MULTIPLE LIFTING LINE  
APPROXIMATION THESE ARE ULTIMATELY REDUCED TO  
SIMULTANEOUS LINEAR ALGEBRAIC EQUATIONS FOR MACHINE  
INVERSION. PROGRAMS FOR DIGITAL COMPUTER HAVE BEEN  
DEVELOPED FOR THE CASE OF ROUND SLIPSTREAMS  
DISTRIBUTED WITH LATERAL SYMMETRY ON A RECTANGULAR  
WING. (AUTHOR)

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UNCLASSIFIED

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-743 555 17/7 1/3  
NATIONAL AVIATION FACILITIES EXPERIMENTAL CENTER ATLANTIC  
CITY N J

EVALUATION OF STOL MODULAR INSTRUMENT LANDING  
SYSTEM (MODILS).

(U)

DESCRIPTIVE NOTE: FINAL REPT. MAY 70-JUL 71,  
MAY 72 54P ADAMS, GLEN D. I  
REPT. NO. FAA-NA-72-11  
PROJ: FAA-320-114-02X  
MONITOR: FAA-RD 72-4

UNCLASSIFIED REPORT

DESCRIPTORS: (GLIDE PATH SYSTEMS;  
RELIABILITY (ELECTRONICS)), (SHORT TAKE-OFF  
PLANES; INSTRUMENT LANDINGS); C BAND; DISTANCE-  
MEASURING EQUIPMENT; MICROWAVE EQUIPMENT;  
TRANSMITTER-RECEIVERS; AIRCRAFT ANTENNAS;  
PROPORTIONAL NAVIGATION; FLIGHT TESTING (U)  
IDENTIFIERS: MODILS (MODULAR INSTRUMENT LANDING  
SYSTEMS); MODULAR INSTRUMENT LANDING SYSTEMS,  
EVALUATION (U)

THE FAA PROCURED TWO MODULAR INSTRUMENT LANDING  
SYSTEM (MODILS) GROUND STATIONS FOR SHORT TAKE-OFF  
AND LANDING (STOL) OPERATIONAL EVALUATION.  
MODILS OPERATES AT 5.2 GHZ (C-BAND SOLID-STATE  
TRANSMITTER), PROVIDING LOCALIZER AND GLIDE SLOPE  
SIGNALS, FROM A COMMON SITE, FOR APPROACH GUIDANCE TO  
AIRCRAFT EQUIPPED WITH A MODILS RECEIVER.  
PROPORTIONAL GUIDANCE IS PROVIDED FROM 3 DEGREES TO  
12 DEGREES ELEVATION AND ABOUT PLUS OR MINUS 30  
DEGREES IN AZIMUTH. THE PILOT MAY SELECT HIS GLIDE  
SLOPE ANGLE IN INCREMENTS OF 0.1 DEGREES, AND ONE OF  
THREE LOCALIZER COURSES; PARALLEL TO RUNWAY  
CENTERLINE, 2 DEGREES SKEW ONE SIDE AND 6 DEGREES  
SKEW THE OTHER SIDE. THE PILOT MAY ALSO SELECT HIS  
INDICATOR SENSITIVITIES. AN INTEGRAL DISTANCE  
MEASURING EQUIPMENT (DME) IS INCLUDED WHICH  
PROVIDES READOUTS TO 0.01 NMI. THE SYSTEM PROVIDES  
GOOD QUALITY GUIDANCE SIGNALS TO ADEQUATELY SUPPORT  
CATEGORY I TYPE (200-FOOT DECISION HEIGHT)  
OPERATIONS. (AUTHOR) (U)

UNCLASSIFIED

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UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-743 829 1/3 1/2  
AIR FORCE FLIGHT DYNAMICS LAB WRIGHT-PATTERSON AFB  
OHIO

STATIC AND DROP TESTS OF A QUARTER SCALE  
MODEL OF THE CC-115 AIRCRAFT EQUIPPED WITH AN  
AIR CUSHION LANDING SYSTEM.

(U)

DESCRIPTIVE NOTE: TECHNICAL MEMO.;  
JAN 72 44P VAUGHN, JOHN C. , III;  
CAMPBELL, SHADE ; POOL, DAVID J. ;  
REPT. NO. AFFDL-TM-72-01-FEM

UNCLASSIFIED REPORT

DESCRIPTORS: (•SHORT TAKE-OFF PLANES, •AIRCRAFT  
LANDINGS), AIRPLANE MODELS, DROP TESTING, GROUND  
EFFECT MACHINES, HOVERING, TEST EQUIPMENT, TEST  
METHODS

(U)

IDENTIFIERS: CC-115 AIRCRAFT, ACLS; AIR CUSHION  
LANDING SYSTEMS), AIR CUSHION LANDING  
SYSTEMS

(U)

STATIC LOAD DEFLECTION TESTS AND VERTICAL DROP  
TESTS WERE PERFORMED ON A QUARTER SCALE MODEL OF A  
CANADIAN CC-115 (BUFFALO) AIRCRAFT EQUIPPED  
WITH AN AIR CUSHION LANDING SYSTEM (ACLS).  
THE MODEL WEIGHED 610 LBS AND THE ACLS AIR SUPPLY  
WAS FURNISHED BY TWO ELECTRIC FANS. THE STATIC LOAD  
DEFLECTION TESTS SHOWED THAT THE MODEL WEIGHT COULD  
BE INCREASED FROM 610 LBS TO 1310 LBS BEFORE THE FANS  
STALLED. THE MODEL DEFLECTION ONE INCH WHEN 560 LBS  
WERE ADDED TO IT DURING HOVER OVER A SOLID SURFACE.  
THE PORTION OF THE WEIGHT SUPPORTED BY THE TRUNK  
(INSTEAD OF THE CUSHION) INCREASED FROM 3% AT  
610 LBS TO 24% AT 1310 LBS. (AUTHOR)

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UNCLASSIFIED

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UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-744 104 1/3  
AIR FORCE FLIGHT DYNAMICS LAB WRIGHT-PATTERSON AFB  
OHIO

A STUDY OF THE EFFECTS OF PARAMETER  
VARIATION ON THE FLYING QUALITIES OF THE XV-  
4B V/STOL AIRCRAFT.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT., OCT 67-OCT 69,  
MAR 72 133P JONES, ARTHUR G. ;  
REPT. NO. AFFDL-TR-72-44  
PROJ: AF-82190712

UNCLASSIFIED REPORT

DESCRIPTORS: (•SHORT TAKE-OFF PLANES,  
PERFORMANCE(ENGINEERING)), HOVERING,  
PITCH(MOTION), STABILITY, ROLL, AERODYNAMIC  
CHARACTERISTICS, MATHEMATICAL ANALYSIS  
IDENTIFIERS: V-4 AIRCRAFT, XV-4B AIRCRAFT,  
TRANSITION FLIGHT

(U)

(U)

THE DOMINATING INFLUENCE OF THE PROPULSION SYSTEM  
ON THE DYNAMIC MOTION OF A V/STOL AIRCRAFT  
OPERATING IN THE HOVER OR LOW-VELOCITY FLIGHT MODES  
HAS GREATLY INCREASED THE DIFFICULTY OF DEVELOPING  
SUCH AN AIRCRAFT TO BE STABLE AND CONTROLLABLE DURING  
THESE MODES. SMALL VARIATIONS IN STABILITY  
DERIVATIVES CAUSED BY EITHER CHANGES IN THE  
PROPULSIVE SYSTEM OR ERRORS IN MEASUREMENT OR  
ANALYTICAL PREDICTION PROGRAMS HAVE BEEN SHOWN TO  
CAUSE SIGNIFICANT CHANGES IN THE DYNAMIC  
CHARACTERISTICS OF SUCH AIRCRAFT. TO BETTER  
UNDERSTAND RELATIONSHIPS, A PROGRAM WAS PERFORMED  
USING THE LOCKHEED XV-4B JET-LIFT AIRCRAFT AS A  
SUBJECT CONFIGURATION. DURING THIS PROGRAM, THE  
MAGNITUDES OF TEN OF THE STABILITY DERIVATIVES USED  
TO DESCRIBE THE AIRCRAFT WERE VARIED INDIVIDUALLY,  
AND THE CHANGE IN THE ROOTS OF THE LINEARIZED,  
UNCOUPLED EQUATIONS OF MOTION NOTED. (AUTHOR)

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UNCLASSIFIED

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UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

NO 591 1/4  
SIEGLER INC GRAND RAPIDS MICH INSTRUMENT DIV

RESEARCH AND DEVELOPMENT OF A CONTROL-DISPLAY  
SYSTEM FOR A TACTICAL V/STOL WEAPON SYSTEM. (U)

DESCRIPTIVE NOTE: FINAL REPT. MAY 65-MAY 66,  
DEC 66 86P FELLINGER, JERRY G. ;

HARDWICKE, ROGER M. ;

REPT. NO. GRR-66-1221

CONTRACT: AF 33(615)-2540

PROJ: AF-6190

TASK: 619011

MONITOR: AFFDL TR-66-118

UNCLASSIFIED REPORT

DESCRIPTORS: (•VERTICAL TAKE-OFF PLANES, FLIGHT  
INSTRUMENTS). (•SHORT TAKE-OFF PLANES, FLIGHT  
INSTRUMENTS). FEASIBILITY STUDIES, FLIGHT  
SIMULATORS, DISPLAY SYSTEMS, INSTRUMENT PANELS,  
PROGRAMMING (COMPUTERS), COMPUTER LOGIC,  
ATTITUDE INDICATORS, COURSE INDICATORS, HOVERING,  
CATHODE RAY TUBES, TACTICAL WEAPONS, FLIGHT  
CONTROL SYSTEMS, INSTRUMENT LANDINGS, FLIGHT SPEED  
INDICATORS (U)  
IDENTIFIERS: LIFT ENGINES, CRUISE ENGINES (U)

THIS REPORT DESCRIBES A 12-MONTH STUDY EFFORT TO  
INVESTIGATE THE REQUIREMENTS OF V/STOL CONTROL-  
DISPLAY SYSTEMS. DURING THE EVALUATION PHASE A  
FIXED-BASE, DYNAMIC SIMULATOR WAS USED TO REPRESENT A  
V/STOL AIRCRAFT WITH FOUR LIFT ENGINES AND TWO  
CRUISE ENGINES. THE LOW SPEED FLIGHT REGIMES,  
PARTICULARLY THE LANDING TRANSITION, RECEIVED PRIMARY  
EMPHASIS. CONTROLLED EXPERIMENTS WERE CONDUCTED TO  
EVALUATE FOUR SEPARATE HOVER INDICATOR CONCEPTS  
INCLUDING HORIZONTAL SITUATION INDICATOR, CATHODE RAY  
TUBE, ATTITUDE DIRECTOR INDICATOR, AND  
ELECTROLUMINESCENT CROSS-GRID DISPLAYS. THESE  
EXPERIMENTS INDICATED THAT IFR APPROACHES WITH V/  
STOL AIRCRAFT CAN BE MADE SAFELY AND EFFICIENTLY  
AND THAT THE CONTROL-DISPLAY SYSTEM HAS A SIGNIFICANT  
EFFECT OF FUEL CONSUMPTION, LANDING SITE  
REQUIREMENTS, AND PILOT PERFORMANCE IN MAKING LANDING  
APPROACHES. RESULTS OF INTEGRATED FLIGHT  
CONTROL SYSTEM REQUIREMENTS ANALYSIS ARE  
DISCUSSED AND PRELIMINARY DESIGNS OF FLIGHT DIRECTOR  
AND AUTOPILOT SYSTEMS ARE DESCRIBED. (AUTHOR) (U)

UNCLASSIFIED

/ZOM08

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-807 697 1/4  
HONEYWELL INC MINNEAPOLIS MINN SYSTEMS AND RESEARCH  
CENTER

DISPLAY AND CONTROL REQUIREMENTS STUDY FOR A V/STOL  
TACTICAL AIRCRAFT. VOLUME I. ANALYSES. (U)

DESCRIPTIVE NOTE: FINAL TECHNICAL REPT. 1 JUN 65-1 JUN  
66.

DEC 66 139P OLSON, BERNARD A. I  
REPT. NO. 12512-FR1-VOL-1  
CONTRACT: AF 33(615)-2527  
PROJ: AF-6190  
TASK: 6190011  
MONITOR: AFFDL TR-66-114-VOL-1

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SHORT TAKE-OFF PLANES, DISPLAY  
SYSTEMS), (\*VERTICAL TAKE-OFF PLANES, DISPLAY  
SYSTEMS), FLIGHT INSTRUMENTS, TACTICAL WEAPONS,  
SIMULATION, LEVEL FLIGHT, HOVERING, AIRCRAFT  
LANDINGS, PROGRAMMING (COMPUTERS), TAKE-OFF,  
DIGITAL COMPUTERS, DATA PROCESSING SYSTEMS,  
PROGRAMMING LANGUAGES, INSTRUMENT LANDINGS. (U)  
IDENTIFIERS: FORTRAN (U)

A STUDY OF THE DISPLAY/CONTROL REQUIREMENTS FOR A  
TACTICAL V/STOL AIRCRAFT WAS CONDUCTED USING  
ANALYTICAL AND SIMULATION TECHNIQUES. WORKLOAD  
LEVELS WERE CALCULATED BY THE DISCONTINUOUS CONTROL  
ANALYSIS TECHNIQUE FOR THE V/STOL CREW'S DISCRETE  
TASKS. PILOT WORKLOAD LEVELS WERE EMPIRICALLY  
ESTABLISHED FOR LEVEL AERODYNAMIC FLIGHT, TRANSITION  
TO HOVER, HOVER, AND LANDING FROM HOVER. A  
SCIENTIFIC DATA SYSTEMS 9300 HYBRID COMPUTER  
WAS USED TO SIMULATE THE UNIQUE MISSION PHASES OF A  
V/STOL AIRCRAFT. THE STOL LANDING AND  
TAKCOFF MISSION PHASES WERE ALSO SIMULATED. THREE  
LANDING DISPLAY FORMATS, TWO MANUAL CONTROL MODES,  
THREE THRUST-TO-WEIGHT RATIOS AND THREE WIND  
CONDITIONS WERE EVALUATED. A LANDING DISPLAY  
FORMAT WAS DEVELOPED THAT WAS DEMONSTRATED ON THE  
HYBRID SIMULATION TO BE FEASIBLE FOR OPERATING A V/  
STOL IFR WITH MINIMUM ELECTRONIC AIDS ON THE  
GROUND AND LESS THAN 100 PERCENT PILOT WORKLOAD.  
(AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-807 698 1/4  
HONEYWELL INC MINNEAPOLIS MINN SYSTEMS AND RESEARCH  
CENTER

DISPLAY AND CONTROL REQUIREMENTS STUDY FOR A V/STOL  
TACTICAL AIRCRAFT. VOLUME II. APPENDIXES. (U)

DESCRIPTIVE NOTE: FINAL TECHNICAL REPT. 1 JUN 65-1 JUN  
66,

DEC 66 203P OLSON, BERNARD A. I  
REPT. NO. 12512-FRI-VOL-2  
CONTRACT: AF 33(615)-2527  
PROJ: AF-6190  
TASK: 6190D11  
MONITOR: AFFDL TR-66-114-VOL-2

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SHORT TAKE-OFF PLANES, DISPLAY  
SYSTEMS), (\*VERTICAL TAKE-OFF PLANES, DISPLAY  
SYSTEMS), FLIGHT INSTRUMENTS, INSTRUMENT LANDINGS,  
SIMULATION, LEVEL FLIGHT, HOVERING, AIRCRAFT  
LANDINGS, PROGRAMMING (COMPUTERS), TAKE-OFF,  
DIGITAL COMPUTERS, DATA PROCESSING SYSTEMS,  
TACTICAL WEAPONS, PROGRAMMING LANGUAGES (U)  
IDENTIFIERS: FORTRAN (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM08

AD-909 185 1/3 20/4  
AIR FORCE AERO PROPULSION LAB WRIGHT-PATTERSON AFB  
OHIO

AN ANALYTICAL METHOD OF DETERMINING GENERAL DOWNWASH  
FLOW FIELD PARAMETERS FOR V/STOL AIRCRAFT. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT. APR-AUG 66,  
NOV 66 61P HOHLER, DAVID J. I  
REPT. NO. AFAPL-TR-66-90  
PROJ: AF-8174  
TASK: 817401

UNCLASSIFIED REPORT

DESCRIPTORS: (•VERTICAL TAKE-OFF PLANES,  
DOWNWASH), (•SHORT TAKE-OFF PLANES, DOWNWASH),  
EXHAUST GASES, GRAPHICS, EQUATIONS, FLOW FIELDS,  
PERFORMANCE(ENGINEERING), MATHEMATICAL ANALYSIS,  
VELOCITY, EXPERIMENTAL DATA, TERRAIN, PRESSURE,  
MATHEMATICAL PREDICTION, HAZARDS (U)

THIS REPORT PRESENTS A METHOD OF ANALYTICALLY  
DETERMINING THE GENERAL DOWNWASH FLOW FIELD  
PARAMETERS OF VARIOUS TYPES OF V/STOL AIRCRAFT.  
THE BASIC DIFFERENCE BETWEEN THE OPERATION OF V/  
STOL AIRCRAFT AND CONVENTIONAL AIRCRAFT IS THEIR  
METHOD OF TAKE-OFF AND LANDING. DURING THESE  
OPERATIONS, V/STOL AIRCRAFT PRODUCE HIGH DOWNWASH  
AIR VELOCITIES THAT IMPINGE AND SPREAD OUT OVER THE  
SURFACE OF THE GROUND. DEPENDING ON THE SIZE,  
TYPE, AND NUMBER OF ENGINES ON THE AIRCRAFT, THIS  
DOWNWASH CAN CAUSE DAMAGE TO NEARBY AIRCRAFT,  
EQUIPMENT, OR PERSONNEL. PAST THEORETICAL METHODS  
BASED ON INCOMPRESSIBLE FLOW THEORY HAVE BEEN  
UNSUCCESSFUL IN ESTABLISHING A MEANS OF COMPUTING  
THIS DOWNWASH FLOW FIELD. A COMBINED METHOD,  
HOWEVER, OF PROVEN EXPERIMENTAL DATA AND CERTAIN  
ANALYTICAL APPROACHES HAVE YIELDED A USEFUL MEANS OF  
PREDICTING THE GENERAL DOWNWASH FLOW FIELD  
PARAMETERS. THIS REPORT PRESENTS THESE APPROACHES  
AND DEMONSTRATES THEIR USEFULNESS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-818 980 1/3 1/5  
ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG  
MISS

PILOT STUDY OF RESPONSE OF CV-2 AIRCRAFT TO IRREGULAR  
TERRAIN. (U)

DESCRIPTIVE NOTE: FINAL REPT. SEP-OCT 65,  
JUL 67 108P GREEN, ANDREW J. , JR.  
RUSH, EDGAR S. I  
REPT. NO. AEWES-TR-3-790  
PROJ: DA-1-V-0-21701-A-047

UNCLASSIFIED REPORT

DESCRIPTORS: (•SHORT TAKE-OFF PLANES, •LANDING  
FIELDS), CANADA, TERRAIN, SURFACE ROUGHNESS,  
TAKE-OFF, AIRCRAFT LANDINGS, TAXIING,  
MATHEMATICAL PREDICTION, COMPUTER PROGRAMS,  
MATHEMATICAL MODELS, FLIGHT TESTING, LANDING GEAR,  
RESPONSES, ARMY AIRCRAFT (U)  
IDENTIFIERS: V-2 AIRCRAFT (U)

THE INVESTIGATION REPORTED HEREIN WAS A PILOT STUDY  
UNDERTAKEN TO DEVELOP MEANS OF PREDICTING THE  
PERFORMANCE OF A CV-2 AIRCRAFT ON IRREGULAR TERRAIN  
AND OF QUANTIFYING SURFACE ROUGHNESS. SPECIAL  
TESTS WERE CONDUCTED TO ASCERTAIN THE NATURAL  
FREQUENCY AND DAMPING CHARACTERISTICS IN BOTH THE  
VERTICAL AND HORIZONTAL DIRECTIONS OF THE ELEMENTS OF  
THE AIRCRAFT. LANDING, TAKEOFF, AND TAXI TESTS  
WERE CONDUCTED AT 16 FIELD SITES IN THREE GENERAL  
AREAS; ACCELEROMETERS AND STRAIN GAGES WERE USED TO  
RECORD RESPONSES OF 12 CRITICAL COMPONENTS OF THE  
AIRCRAFT. SIMPLE MATHEMATICAL MODELS TO PREDICT  
THE DYNAMIC RESPONSES OF CERTAIN OF THE AIRCRAFT  
COMPONENTS WERE DEVELOPED FOR SOLUTION BY BOTH ANALOG  
AND DIGITAL COMPUTERS AND WERE VERIFIED BY COMPARISON  
WITH MEASURED DATA. BECAUSE OF CERTAIN ASSUMPTIONS  
USED IN THE DEVELOPMENT OF THE MODELS, THE PREDICTED  
DATA DID NOT AGREE EXACTLY WITH THE ACTUAL DATA.  
ALTHOUGH THE PREDICTIONS WERE OF USEFUL ACCURACY,  
IT IS RECOMMENDED THAT AN ANALOG MODEL, EXCITED BY  
MEASURED TERRAIN DATA, BE USED TO DETERMINE THE  
ADEQUACY OF A SURFACE FOR LANDINGS OF THE CV-2  
AIRCRAFT. TO OBTAIN THE TERRAIN INPUT, AN  
OUTRIGGER TRAILER DYNAMOMETER WITH AN ACTUAL  
PROTOTYPE AIRCRAFT TIRE AS THE TERRAIN FOLLOWER IS  
PROPOSED. (AUTHOR)

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UNCLASSIFIED

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UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-819 971 1/3 20/4 5/5  
ARMY TRANSPORTATION RESEARCH COMMAND FORT EUSTIS VA

CAL/TRECOM SYMPOSIUM PROCEEDINGS VOL II. DYNAMIC  
LOAD PROBLEMS ASSOCIATED WITH HELICOPTERS AND V/STOL  
AIRCRAFT, JUNE 26-28, BUFFALO, N.Y. (U)

63 2919

UNCLASSIFIED REPORT

DESCRIPTION: (\*HELICOPTERS, AERODYNAMIC  
CHARACTERISTICS), (\*VERTICAL TAKE-OFF PLANES,  
AERODYNAMIC LOADING), (\*SHORT TAKE-OFF PLANES,  
SYMPOSIA), ARMY AIRCRAFT, WIND TUNNEL MODELS,  
AIRPLANE MODELS, FLIGHT TESTING, STRESSES, LEVEL  
FLIGHT, TRANSPORT PLANES, TILT WINGS, STRUCTURAL  
PROPERTIES, PROPELLERS(AERIAL), FLUTTER,  
MILITARY REQUIREMENTS, DRIVE SHAFTS, VIBRATION,  
DATA PROCESSING SYSTEMS, ROTOR BLADES(ROTARY  
WINGS), ROTARY WINGS, MAN-MACHINE SYSTEMS, HUMAN  
ENGINEERING, GUST LOADS, LOADING(MECHANICS),  
AIRCRAFT LANDINGS

(U)

IDENTIFIERS: C-142 AIRCRAFT, GUST ALLEVIATION

(U)

CONTENTS: A REVIEW OF THE STRUCTURAL  
DYNAMIC CHARACTERISTICS OF THE XC-142A  
AIRCRAFT; PROPELLER WHIRL FLUTTER  
CONSIDERATIONS FOR V/STOL AIRCRAFT; HIGH-  
SPEED SHAFTING FOR POWER TRANSMISSION IN  
AIRCRAFT; DYNAMIC TORSIONAL PROBLEMS IN  
VTOL DRIVE TRAINS WITH UNIVERSAL JOINTS;  
RECENT WORK AT THE ROYAL AIRCRAFT  
ESTABLISHMENT ON HELICOPTER DYNAMIC LOADS;  
WITH PARTICULAR REFERENCE TO HIGH BLADE  
INCIDENCE PROBLEMS; SOME RESULTS FROM THE  
ARMY LOW ALTITUDE, HIGH-SPEED FLIGHT  
PROGRAM (MAN-MACHINE); HUMAN FACTOR  
PROBLEMS ASSOCIATED WITH LOW ALTITUDE HIGH-  
SPEED (LAHS) FLIGHT; EFFECT OF GUST  
ALLEVIATION SYSTEM ON DYNAMIC AIRLOADS; AND  
AN ANALYTICAL INVESTIGATION OF AIRCRAFT  
LOADS INDUCED BY ROUGH TERRAIN  
LANDINGS.

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UNCLASSIFIED

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UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-819 972 1/3 20/4  
ARMY TRANSPORTATION RESEARCH COMMAND FORT EUSTIS VA

CAL/TRECOM SYMPOSIUM PROCEEDINGS VOL III. DYNAMIC  
LOAD PROBLEMS ASSOCIATED WITH HELICOPTERS AND V/STOL  
AIRCRAFT, JUNE 26-28, BUFFALO, N.Y. (U)

63 101P

UNCLASSIFIED REPORT

DESCRIPTORS: (\*HELICOPTERS, AERODYNAMIC  
CHARACTERISTICS), (\*VERTICAL TAKE-OFF PLANES,  
AERODYNAMIC LOADING), (\*SHORT TAKE-OFF PLANES,  
SYMPOSIA), ARMY AIRCRAFT, DUCTED FANS, AXIAL-  
FLOW FANS, RESEARCH PLANES, TRANSPORT PLANES,  
STRESSES, AIRCRAFT INDUSTRY, WING-BODY  
CONFIGURATIONS, ROTOR BLADES(ROTARY WINGS),  
ROTARY WINGS, STRUCTURAL PROPERTIES, VIBRATION,  
HELICOPTER ROTORS, BLADE AIRFOILS, HARMONIC  
ANALYSIS, LOADING(MECHANICS), DRIVE SHAFTS,  
TILT WINGS, FUSELAGES, FLUTTER,  
PROPELLERS(AERIAL), VECTOR ANALYSIS (U)  
IDENTIFIERS: LIFT ENGINES, C-130 AIRCRAFT, V-4  
AIRCRAFT, V-5 AIRCRAFT, TRANSITION FLIGHT,  
HELICOPTER BLADE TIPS, C-142 AIRCRAFT, H-21  
AIRCRAFT (U)

CONTENTS: PRESENT AND FUTURE HELICOPTER  
DYNAMIC LOADS RESEARCH; DYNAMIC LOADS  
PROBLEMS; STATUS OF HELICOPTER DYNAMIC LOAD  
PROBLEMS AT HILLER AIRCRAFT COMPANY;  
DYNAMIC LOADS RESEARCH; HELICOPTER DYNAMIC  
LOADS RESEARCH REQUIREMENTS; DYNAMIC LOAD  
PROBLEMS ASSOCIATED WITH V/STOL AIRCRAFT;  
UNRESOLVED DYNAMIC LOADS PROBLEMS  
ASSOCIATED WITH V/STOL AIRCRAFT OF  
CONVENTIONAL STRUCTURAL CONFIGURATIONS;  
DYNAMIC LOAD PROBLEMS ASSOCIATED WITH V/  
STOL AIRCRAFT; TWO XV-5A DYNAMIC LOAD  
CHARACTERISTICS; AND DYNAMIC LOAD PROBLEMS OF  
V/STOL AIRCRAFT. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-825 451 1/3 20/4  
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF  
ENGINEERING

THE RESPONSE OF A HOVERING V/STOL AIRCRAFT TO  
DISCRETE TURBULENCE.

(U)

DESCRIPTIVE NOTE: MASTER'S THESIS,  
JUN 67 116P GOGOSHA, OREST R. IMORIARTY,  
THOMAS E. I  
REPT. NO. GGC/EE/67-7

UNCLASSIFIED REPORT

DESCRIPTORS: (•TRANSPORT PLANES,  
PERFORMANCE(ENGINEERING)), (•VERTICAL TAKE-OFF  
PLANES, AERODYNAMIC CHARACTERISTICS), (•SHORT  
TAKE-OFF PLANES, HOVERING), TURBULENCE,  
RESPONSE, VORTICES, SHEAR STRESSES, STABILITY,  
MATHEMATICAL MODELS, DIGITAL COMPUTERS, TILT  
WINGS, GUST LOADS, CONTROL SYSTEMS, PILOTS,  
TRANSFER FUNCTIONS  
IDENTIFIERS: C-142 AIRCRAFT

(U)

(U)

THE REPORT ANALYZES THE PERFORMANCE OF THE XC-142A V/STOL AIRCRAFT IN HOVER WHEN SUBJECTED TO DISCRETE TURBULENCE INPUTS IN THE FORM OF VORTICES AND WIND SHEAR. THE AIRCRAFT AND TURBULENCE ARE REPLACED BY APPROXIMATE MATHEMATICAL MODELS AND THE RESPONSE OF THE AIRCRAFT IS CALCULATED USING A DIGITAL COMPUTER. BY USING THE RESULTS OF A SEPARATE ANALOG SIMULATION, TWO PILOT TRANSFER FUNCTIONS ARE DEVELOPED WHICH SATISFACTORILY PERFORM THE ASSIGNED STATION KEEPING TASK. CONTROL SENSITIVITIES ARE COMPUTED AND COMPARED TO MAXIMUM AVAILABLE VALUES. IT IS CONCLUDED THAT CONTROL POWER IS NOT A LIMITING FACTOR IN THE PERFORMANCE OF THE XC-142A IN HOVER. (AUTHOR)

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UNCLASSIFIED

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UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-835 232 4/1 1/3  
TRAVELERS RESEARCH CENTER INC HARTFORD CONN

TAKE-OFF AND LANDING CRITICAL ATMOSPHERIC TURBULENCE  
(TOLCAT) ANALYTICAL INVESTIGATION. (U)

DESCRIPTIVE NOTE: FINAL REPT. APR 67-MAR 68,  
MAR 68 93P BOWNE, NORMAN E.; ANDERSON,  
GERALD E. ;  
CONTRACT: F33615-67-C-1557  
PROJ: AF-7235  
MONITOR: AFFDL TR-68-23

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SHORT TAKE-OFF PLANES, \*CLEAR AIR  
TURBULENCE), ATMOSPHERIC MOTION, TAKE-OFF,  
AIRCRAFT LANDINGS, BOUNDARY LAYER, HANDLING,  
PROBABILITY, NAVIER-STOKES EQUATIONS, STRESSES,  
VISCOSITY, DIFFUSION, HEAT, STABILITY,  
VELOCITY, MODELS(SIMULATIONS), ANEMOMETERS,  
MEASUREMENT, LOW ALTITUDE, VERTICAL TAKE-OFF  
PLANES (U)

IDENTIFIERS: TOLCAT(TAKE OFF AND LANDING  
CRITICAL ATMOSPHERIC TURBULENCE) (U)

A REVIEW AND ANALYSIS OF CURRENT KNOWLEDGE OF  
TURBULENCE IN THE ATMOSPHERIC BOUNDARY LAYER IS  
PRESENTED. PARTICULAR EMPHASIS IS ON IDENTIFYING  
AND ANALYZING THE ASPECTS OF LOW ALTITUDE TURBULENCE  
THAT HAVE THE GREATEST INFLUENCE ON THE DESIGN AND  
OPERATION OF V/STOL AIRCRAFT IN THE ATMOSPHERIC  
BOUNDARY LAYER. THE NATURE, QUALITY AND  
APPLICABILITY OF REPORTED TURBULENCE MEASUREMENTS IS  
DISCUSSED, AND SEVERAL RESULTING EMPIRICAL  
DESCRIPTIONS OF THE BOUNDARY LAYER ARE COMPARED.  
DEFICIENCIES IN THE DATA ARE SPECIFICALLY  
IDENTIFIED AND DISCUSSED. THE FOUNDATIONS,  
ASSUMPTIONS, AND LIMITATIONS OF THE STATISTICAL  
ANALYSES OF BOUNDARY LAYER TURBULENCE WHICH ARE NOW  
IN USE ARE IDENTIFIED AND DISCUSSED. THE NATURE OF  
ATMOSPHERE-VEHICLE INTERACTIONS AND CURRENT AND  
POTENTIAL METHODS OF ANALYZING THESE INTERACTIONS ARE  
DISCUSSED. (AUTHOR) (U)

UNCLASSIFIED

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-838 391 1/3 12/1  
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF  
ENGINEERING

A SIMPLE GRAPHICAL METHOD FOR EVALUATING THE EFFECT  
OF THRUST VECTOR TILT ON THE AIRCRAFT PERFORMANCE. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
JUL 68 34P BIELKOWICZ, PETER I  
MONITOR: AFIT TH-68-6

UNCLASSIFIED REPORT

DESCRIPTORS: (\*VERTICAL TAKE-OFF PLANES, THRUST),  
(\*SHORT TAKE-OFF PLANES, TILT WINGS), VECTOR  
ANALYSIS, ANGLE OF ATTACK, JET MIXING FLOW,  
DEFLECTION, NUMERICAL METHODS AND PROCEDURES,  
EQUATIONS OF MOTION, AERODYNAMIC CHARACTERISTICS,  
FLIGHT PATHS, VELOCITY (U)  
IDENTIFIERS: \*THRUST VECTOR TILT, (U)  
GRAPHS(CHARTS)

THE SEMI-GRAPHICAL METHOD PRESENTED IN THE REPORT  
MAY BE USEFUL FOR THE PRELIMINARY PERFORMANCE  
COMPUTATION FOR AN AIRCRAFT WITH THE VARIABLE THRUST  
AXIS TILT. APPLICATION TO DIFFERENT FLIGHT  
PROBLEMS IS SHOWN. OPTIMIZATION OF SOME FLIGHT  
PARAMETERS CAN BE ACHIEVED BY SIMPLE GRAPHICAL  
CONSTRUCTION. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-838 777 1/3 20/4 9/2  
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF  
ENGINEERING

A PRELIMINARY ANALYSIS OF THE XV-4B VTOL AIRCRAFT  
COMPUTER SIMULATION. (U)

DESCRIPTIVE NOTE: MASTER'S THESIS,  
MAR 68 223P KELLAR, ROBERT P. GREEN,  
DONALD C. I  
REPT. NO. GAM/AE-68-4

UNCLASSIFIED REPORT

DESCRIPTORS: (SHORT TAKE-OFF PLANES, AERODYNAMIC  
CHARACTERISTICS), RESEARCH PLANES, MATHEMATICAL  
MODELS, SIMULATION, STABILITY, CONTROL,  
ELEVATORS, AERIAL RUDDERS, HANDLING, VERTICAL  
TAKE-OFF PLANES, AILERONS, PITCH(MOTION),  
THESES, FLOW CHARTING, GROUND EFFECT (U)  
IDENTIFIERS: COMPUTER SIMULATION, XV-4B  
AIRCRAFT, DEGREES OF FREEDOM (U)

THIS STUDY WAS A PRELIMINARY ANALYSIS TO DETERMINE  
THE EFFECT UPON STABILITY AND CONTROL OF THE XV-  
4B VTOL AIRCRAFT, DUE TO A VARIATION OF  
AERODYNAMIC DERIVATIVES. SOME INFORMATION IS  
PRESENTED ON A HYBRID COMPUTER SYSTEM WHICH WAS USED.  
A PITCHING MOMENT ANALYSIS WAS MADE WITH AN  
ELEVATOR STEP INPUT. A LATERAL-DIRECTIONAL  
ANALYSIS WAS MADE WITH A RUDDER AND AILERON IMPULSE.  
VARIATIONS WERE MADE FOR FOUR DIFFERENT FLIGHT  
CONDITIONS. THE AIRCRAFT WAS TRIMMED AT EACH  
FLIGHT CONDITION AND A NOMINAL RUN WAS RECORDED.  
THEN EACH DERIVATIVE WAS VARIED, ONE AT A TIME, AND  
THE RESULTS RECORDED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM08

AD-838 823 1/3 20/4  
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF  
ENGINEERING

THE AERODYNAMIC CHARACTERISTICS OF NON-AERODYNAMIC  
SHAPES. (U)

DESCRIPTIVE NOTE: MASTER'S THESIS,  
JUN 68 66P LEHMANN, MAURICE JOHN WILLIAM  
;  
REPT. NO. GAM/AE/68-6

UNCLASSIFIED REPORT

DESCRIPTORS: (•SHORT TAKE-OFF PLANES, EXTERNAL  
STORES), (•EXTERNAL STORES, AERODYNAMIC  
CHARACTERISTICS), HELICOPTERS, RECTANGULAR BODIES,  
CYLINDRICAL BODIES, BLUNT BODIES, LIFT, DRAG,  
PITCH(MOTION), ANGLE OF ATTACK, VERTICAL TAKE-  
OFF PLANES, FAIRINGS, STABILITY, FLOW  
VISUALIZATION, WIND TUNNEL MODELS, MODEL TESTS,  
REYNOLDS NUMBER (U)  
IDENTIFIERS: NONAERODYNAMIC SHAPES,  
GRAPHS(CHARTS), DYNAMIC PRESSURE, LIFT DRAG  
RATIO (U)

A WIND TUNNEL INVESTIGATION OF THREE BASIC SHAPES  
(CUBES, RECTANGLES, AND CYLINDERS) WAS CONDUCTED  
TO DETERMINE THE AERODYNAMIC CHARACTERISTICS OF  
SIMILAR SHAPED CARGOS CARRIED EXTERNALLY BY  
HELICOPTERS OR V/STOL AIRCRAFT. THE RATIO OF  
SIDE AREA TO FRONTAL AREA WAS USED AS A PARAMETER TO  
PLOT THE LIFT, DRAG, AND PITCHING MOMENT VERSUS ANGLE  
OF ATTACK FOR THE THREE SHAPES. THE LIFT, DRAG,  
AND PITCHING MOMENT COEFFICIENTS WERE PLOTTED FOR  
ANGLES OF ATTACK FROM +5 DEGREES TO -90 DEGREES.  
THE CHANGE IN SLOPES OF THE PITCHING MOMENT OF BOTH  
RECTANGLES AND CYLINDERS WAS SMOOTH AND GRADUAL  
INDICATING NO RAPID CHANGES IN STATIC STABILITY.  
BY USING A VERY FLAT NOSE FAIRING, IT WAS POSSIBLE  
TO REDUCE THE DRAG BY 30% AT 0 DEGREES ANGLE OF  
ATTACK WITHOUT INCREASING THE FORCES AT THE LARGER  
ANGLES OF ATTACK. (AUTHOR) (U)

UNCLASSIFIED

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-844 579 1/2 1/3  
PRINCETON UNIV N J

THE PRINCETON PENNSYLVANIA ARMY AVIONICS  
RESEARCH PROGRAM.

(U)

DESCRIPTIVE NOTE: ANNUAL REPT. NO. 2, 1 JUN 67-30 JUN  
68.

NOV 68 114P BORN, GERARD J. IDUKES,  
THEODOR A. IDURBIN, ENOCH J. IGRAHAM, FRANK  
D. ISCHMITZ, FREDERIC H. I  
CONTRACT: DA-28-043-AMC-02412(E)  
PROJ: DA-1-H-162202-A-219  
TASK: 1-H-162202-A-21907  
MONITOR: ECOM 02412-2

UNCLASSIFIED REPORT

DESCRIPTORS: (\*HELICOPTERS, FORMATION FLIGHT),  
(\*VERTICAL TAKE-OFF PLANES, TURNING FLIGHT),  
(\*SHORT TAKE-OFF PLANES, EQUATIONS OF MOTION),  
APPROACH, AIRCRAFT LANDINGS, FLIGHT PATHS,  
MATHEMATICAL MODELS,  
TRANSFORMATIONS(MATHEMATICS), GLIDE PATH  
SYSTEMS, TAKE-OFF, INSTRUMENTATION, ELECTROSTATIC  
FIELDS

(U)

IDENTIFIERS: STATION KEEPING, \*MANAGEMENT  
INFORMATION SYSTEMS

(U)

THIS SECOND ANNUAL REPORT OF WORK DONE UNDER  
CONTRACT DA 28-043 AMC-02412(E) IN SUPPORT OF  
THE USAECOM AVIONICS LABORATORY PROGRAM COVERS  
FIVE TASKS: (1) SIMPLE MODELING AND  
FUNDAMENTAL CONSIDERATIONS OF THE STATION KEEPING  
CONTROL LOOP ARE PRESENTED. (2) IN THIS REPORT,  
A PROBLEM OF CONSIDERABLE INTEREST TO PEOPLE INVOLVED  
WITH IMPROVING EXISTING STEADY-STATE STOL TAKE-OFF  
TECHNIQUES IS DISCUSSED THEORETICALLY: MINIMUM  
DISTANCE TO CLEAR AN OBSTACLE OF A GIVEN FIXED  
HEIGHT. (3) A SYSTEM STUDY OF LOW  
VISIBILITY APPROACH AND LANDING IS A SIMULATION  
OF THE CONTROL CHARACTERISTICS OF HELICOPTERS  
COMBINED WITH MODELED CHARACTERISTICS OF THE PILOT TO  
DETERMINE GUIDANCE PARAMETERS NEEDED FOR LOW  
VISIBILITY APPROACHES. (4) AN EXAMINATION OF  
INSTRUMENTATION REQUIREMENTS TO PERMIT CONTROL OF  
HELICOPTER AND VTOL FLIGHT PERFORMANCE. (5)  
RESULTS OF A PRELIMINARY SURVEY OF THE PHENOMENON OF  
TRIBOELECTRICITY AS IT APPLIES TO THE PROBLEM OF  
HELICOPTER ELECTRICAL CHARGING ARE REPORTED.  
(AUTHOR)

144

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-857 455 21/5 1/3  
RYAN AERONAUTICAL CO SAN DIEGO CALIF

SUGGESTED SPECIFICATION FOR A LIFT FAN  
PROPULSION SYSTEM.

(U)

DESCRIPTIVE NOTE: FINAL TECHNICAL REPT. 1 JUL 65-1 MAR  
66,

MAY 69 48P DAVIS, WALTER B. ;ELA,

BENJAMIN W. 1

REPT. NO. 29469-3

CONTRACT: DA-44-177-AMC-345(T)

PROJ: DA-1-F-131201-D-161

MONITOR: USAAVLABS TR-69-22

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SHORT TAKE-OFF PLANES, DUCTED  
FANS), (\*DUCTED FANS, LIFT), TURBOJET ENGINES,  
SPECIFICATIONS, WINGS, DESIGN, INTERFACES  
IDENTIFIERS: \*LIFT FANS

(U)

(U)

THE REPORT PRESENTS PROPULSION SYSTEM COMPONENT  
DESIGN REQUIREMENTS BELIEVED TO BE NECESSARY FOR  
SUCCESSFUL DEVELOPMENT OF OPERATIONAL LIFT FAN  
AIRCRAFT. THE WORK WAS DONE FOR THE PURPOSE OF  
IDENTIFYING LIFT FAN AIRFRAME AND PROPULSION SYSTEM  
PERFORMANCE AND INSTALLATION INTERFACES. THE  
REQUIREMENTS PRESENTED IN THE REPORT REFLECT  
EXPERIENCE GAINED FROM THE XV-5A LIFT FAN  
AIRCRAFT FLIGHT TEST PROGRAM. (AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-857 62 1/3  
AEROPHYSICS CO WASHINGTON D C

REVIEW AND PRELIMINARY EVALUATION OF LIFTING  
HORIZONTAL-AXIS ROTATING-WING AERONAUTICAL  
SYSTEMS (HARWAS). (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
MAR 69 420P FOSHAG, WILLIAM F. BOEHLER,  
GABRIEL D. J  
CONTRACT: DAAJ02-67-C-0046  
PROJ: DA-1-F-162204-A-142  
TASK: 1-F-162204-A-14231  
MONITOR: USAAVLABS TR-69-13

UNCLASSIFIED REPORT

DESCRIPTORS: (•SHORT TAKE-OFF PLANES, •REVIEWS),  
(•ROTARY WINGS, SHORT TAKE-OFF PLANES), VERTICAL  
TAKE-OFF PLANES, LIFT, ROTATION, MAGNUS FORCE,  
AUTOROTATION, PROPELLERS(AERIAL), TURBINES,  
DESIGN, MARINE PROPULSION, AIRFOILS, FLAPS,  
GLIDERS, DECELERATION, RESEARCH PLANES (U)

IDENTIFIERS: HARWAS(HORIZONTAL AXIS ROTATING  
WING AERONAUTICAL SYSTEMS), •HORIZONTAL AXIS  
ROTATING WING AERONAUTICAL SYSTEMS, ROTARY WING  
AIRCRAFT, WINDMILLS, DHC-5 AIRCRAFT, C-5  
AIRCRAFT, CYCLOGIRO AIRCRAFT, HELICOPLANES, X-19  
AIRCRAFT, X-100 AIRCRAFT, MAGNUS EFFECT  
AIRFOILS (U)

AMONG THE PURELY AERONAUTICAL APPLICATIONS, NEAR-  
HORIZONTAL AXIS AS WELL AS HORIZONTAL AXIS DEVICES  
ARE CONSIDERED. THE FORMER COVER THE RADIAL-LIFT  
PROPELLER OR •SELF-PROPELLING• WING; THE LATTER COVER  
MAGNUS EFFECT AND RELATED SYSTEMS; CYCLOGIRO  
SYSTEMS AND HORIZONTAL-AXIS PROPELLER SYSTEMS WITH  
CYCLIC PITCH. A LIMITED INVESTIGATION OF NON-  
AERONAUTICAL APPLICATIONS OF HARWAS IS ALSO MADE,  
WHICH COVERS WING-ROTOR TYPE WINDMILLS, CYCLOGIRO  
WINDMILL TURBINES, MAGNUS EFFECT SHIP PROPULSION  
AND CYCLOIDAL SHIP PROPULSION. APPROXIMATELY 1200  
REFERENCES ARE LISTED. A SERIES OF CROSS-INDEX  
TABLES IS ALSO INCLUDED TO PROVIDE A QUICK MEANS FOR  
THE READER TO DETERMINE THE CONTENT AND AVAILABILITY  
OF THE REFERENCES. AN ANALYSIS OF THE VARIOUS LIFT  
SYSTEMS PERTINENT TO THE HARWAS FIELD IS MADE WITH  
A VIEW TO POTENTIAL AIR VEHICLE APPLICATIONS. OVER  
20 ORIGINAL AERONAUTICAL APPLICATIONS ARE IDENTIFIED  
AND EVALUATED IN THE LIGHT OF RECENT ADVANCES IN  
POWER PLANTS. (U)

146

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-842 843 1/3 20/4 21/5  
LOCKHEED-CALIFORNIA CO BURBANK

PROPULSION STUDY FOR STOL AIR-SEA  
CRAFT.

(U)

DESCRIPTIVE NOTE: FINAL REPT. 16 DEC 68-15 SEP 69,  
SEP 69 149P ANDERSON, ARTHUR B. BROWN,  
ALAN C. HOHMAN, EDWARD H. I  
REPT. NO. LR-22620  
CONTRACT: N00C14-39-C-0024  
PROJ: NR-212-191

UNCLASSIFIED REPORT

DESCRIPTORS: (•SHORT TAKE-OFF PLANES, AERODYNAMIC  
CHARACTERISTICS), (•AMPHIBIAN PLANES,  
•PROPULSION), OPTIMIZATION, ADVANCED PLANNING,  
CANARD CONFIGURATION, LIFT,  
PROGRAMMING (COMPUTERS), TURBOFAN ENGINES,  
AERODYNAMIC CONTROL SURFACES, WEIGHT, DUCTS

(U)

THE PURPOSE OF THE STUDY WAS TO INVESTIGATE  
AERODYNAMIC-PROPULSION CONCEPTS APPLICABLE TO THE  
CANARD CONFIGURATION STOL AIR-SEA CRAFT, AND IN  
PARTICULAR TO DEVELOP AND USE A METHODOLOGY FOR  
OPTIMIZING COMBINATIONS OF DIRECT LIFT AND AUGMENTED  
WING LIFT. A COMPUTER PROGRAM WAS DEVELOPED THAT  
OPTIMIZED THE PROPULSION SYSTEM BY MAXIMIZING THE  
AIRPLANE RANGE FOR A GIVEN MISSION AND A FIXED  
INITIAL AIRPLANE WEIGHT. (AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AU-863 963 1/3  
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

THE EXHIBITION OF NEW SOVIET FIGHTERS AND  
FIGHTER-BOMBERS,

(U)

AUG 69 14P RENDULIC, ZLATKO ;  
REPT. NO. FTD-HT-23-149-69  
PROJ: FTD-7230178

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: EDITED TRANS. OF VAZDUHOPLOVNI  
GLASNIK (YUGOSLAVIA) N1 P24-34 1968.

DESCRIPTORS: (\*JET FIGHTERS, USSR), (\*ATTACK  
BOMBERS, USSR), AERODYNAMIC CHARACTERISTICS,  
SWEEP-BACK WINGS, DELTA WINGS, SUPERSONIC PLANES,  
SHORT TAKE-OFF PLANES, VERTICAL TAKE-OFF PLANES,  
VARIABLE-SWEEP WINGS, STATISTICAL ANALYSIS,  
YUGOSLAVIA

(U)

IDENTIFIERS: TRANSLATIONS

(U)

THIS ARTICLE DEALS WITH MATERIAL WHICH APPEARED IN  
FLUGWELT (NO. 12, 1967) AND INTERAVIA (NO  
9, 1967) AND COVERS SOVIET FIGHTERS AND FIGHTER-  
BOMBERS FROM 1950 TO 1965. ILLUSTRATED ARE THE  
E-166 (EXPERIMENTAL PLANE FROM THE MILOYAN  
DESIGN GROUP), A SUKHOY SINGLE-ENGINE JET FIGHTER  
(MIG 21), A SUKHOY TWIN-ENGINE JET PURSUIT  
PLANE, A PLANE WITH VARIABLE WINGS BASED ON THE SU-  
7B, A LATER VERSION OF THE SAME, AND A LONG-RANGE  
TWIN-JET PURSUIT PLANE FLYING AT 2.8-3 TIMES THE  
SPEED OF SOUND. THESE PLANES ARE COMPARED IN  
AVAILABLE DETAIL WITH PLANES OF WESTERN  
MANUFACTURE. STOL AND VTOL TYPES ARE ALSO  
MENTIONED. THE AUTHOR NOTES THE UNUSUALLY LARGE  
NUMBER OF PLANES PROJECTED IN THE USSR, HE  
MENTIONS THE HAWKER-SIDDELEY P-1127 AS THE MOST  
SUCCESSFUL PLANE OF ITS TYPE AND DISCUSSES THE F-  
111, MIRAGE G, AND YF-11. HE CONCLUDES THAT  
THE LARGE NUMBER OF NEW SOVIET PROTOTYPES INDICATES  
THAT THE USSR IS AGAIN LAYING GREAT STRESS ON  
SUPPORTING AIRCRAFT. (AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-873 264 1/3  
UNITED AIRCRAFT CORP EAST HARTFORD CONN RESEARCH LABS

PRELIMINARY INVESTIGATION OF THE COUNTER-FLOW  
JET FLAP.

(U)

DESCRIPTIVE NOTE: FINAL ENGINEERING REPT. 2 JUN 69-1  
FEB 70,

MAR 70 57P FINK, MARTIN R. ISTOEFFLER,  
RICHARD C. ;  
REPT. NO. UACRL-J910843-3  
CONTRACT: N00019-69-C-0559

UNCLASSIFIED REPORT

DESCRIPTORS: (•JET FLAPS, DESIGN), (•SHORT TAKE-  
OFF PLANES, JET FLAPS), LIFT, FLOW  
VISUALIZATION, TRAILING EDGE,  
MODELS(SIMULATIONS), PITCH(MOTION), JET  
PUMPS, WINGS

(U)

PRELIMINARY EXPERIMENTAL STUDIES WERE CONDUCTED TO  
PROVIDE DESIGN INFORMATION FOR A THREE-DIMENSIONAL  
WING MODEL CONTAINING A COUNTER-FLOW JET FLAP. THIS  
HIGH-LIFT DEVICE USES A FORWARD-FACING EJECTOR TO  
INDUCE AIRFLOW INTO A BLUNT, OPENED TRAILING EDGE.  
THAT FLOW, MIXED WITH THE EJECTOR PRIMARY FLOW, IS  
DIRECTED DOWNWARD AT APPROXIMATELY MID-CHORD OF THE  
WING LOWER SURFACE, JUST DOWNSTREAM OF A SHORT RIGID  
SPLIT FLAP. THE JET FLAP LOCATION AT MID-CHORD IS  
EXPECTED TO PRODUCE SMALL PITCHING MOMENTS ABOUT THE  
QUARTER-CHORD. PRELIMINARY TESTS OF A TWO-  
DIMENSIONAL AIRFOIL IN A SMOKE TUNNEL WERE PERFORMED  
TO OBTAIN QUALITATIVE AERODYNAMIC PERFORMANCE DATA  
AND MEASUREMENTS OF EJECTOR OPERATING ENVIRONMENT.  
TWO-DIMENSIONAL TESTS OF THE JET PUMP, DUCT, AND  
TURNING VANES WERE CONDUCTED TO ASSIST IN SELECTING A  
SATISFACTORY EJECTOR CONFIGURATION. RESULTS OF  
THESE TESTS WERE USED IN THE DESIGN AND CONSTRUCTION  
OF AN UNTWISTED 10-FT SPAN RECTANGULAR WING OF ASPECT  
RATIO 8.4 EQUIPPED WITH A COUNTER-FLOW JET FLAP.  
(AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-684 439 1/3  
CORNELL AERONAUTICAL LAB INC BUFFALO N Y FLIGHT RESEARCH  
DEPT

BACKGROUND INFORMATION AND USER GUIDE FOR  
MIL-F-83300-MILITARY SPECIFICATION --  
FLYING QUALITIES OF PILOTED V/STOL  
AIRCRAFT.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,  
MAR 71 469P CHALK, CHARLES R. ;KEY,  
DAVID L. ;KROLL, JOHN , JR. ;WASSERMAN, RICHARD  
;RADFORD, ROBERT C. ;  
CONTRACT: AF 33(615)-3736, F33615-70-C-1322  
PROJ: AF-698DC  
MONITOR: AFFDL TR-70-88

UNCLASSIFIED REPORT

DESCRIPTORS: (\*VERTICAL TAKE-OFF PLANES,  
PERFORMANCE(ENGINEERING)), (\*SHORT TAKE-OFF  
PLANES, SPECIFICATIONS), MILITARY REQUIREMENTS,  
STATE-OF-THE-ART REVIEWS, FLIGHT TESTING, HOVERING (U)

THE SPECIFICATION WAS COMPILED AFTER AN EXTENSIVE  
LITERATURE REVIEW AND MANY MEETINGS AND DISCUSSIONS  
WITH PERSONNEL FROM ESSENTIALLY ALL CONCERNED  
CIVILIAN AND GOVERNMENTAL ORGANIZATIONS. THE REPORT  
ATTEMPTS TO EXPLAIN THE CONCEPT AND PHILOSOPHY  
UNDERLYING THE V/STOL SPECIFICATION AND TO  
PRESENT SOME OF THE DATA AND ARGUMENTS UPON WHICH THE  
REQUIREMENTS WERE BASED. THE DOCUMENT SHOULD ALSO  
SERVE AS A SUMMARY OF THE STATE OF THE V/STOL  
FLYING QUALITIES ART AS DETERMINED FROM FLIGHT TEST,  
SIMULATION, ANALYSIS, AND THEORY. (AUTHOR) (U)

UNCLASSIFIED

/ZOM08

UNCLASSIFIED

CORPORATE AUTHOR - MONITORING AGENCY

•ADCOLE CORP WALTHAM MASS

• • •  
V/STOL APPROACH SYSTEM.  
(FAA-RD-66-56)  
AD-659 510

•ADVISORY GROUP FOR AERONAUTICAL  
RESEARCH AND DEVELOPMENT PARIS  
(FRANCE)

• • •  
258  
FACTORS LIMITING THE LANDING  
APPROACH SPEED OF AIRPLANES FROM  
THE VIEWPOINT OF A PILOT  
AD-276 616

• • •  
AGARD-203  
TUNNEL-WALL EFFECTS ASSOCIATED  
WITH VTOL-STOL MODEL TESTING,  
AD-661 951

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AGARD-217  
FLIGHT TEST INSTRUMENTATION FOR  
V/STOL AIRCRAFT,  
AD-652 926

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AGARD-271  
METHODES UTILISEES POUR LA MISE  
AU POINT DE L'AVION BREGUET 940 A  
AILES SOUFFLEES (METHODS USED FOR  
THE FINAL DESIGN ANALYSIS OF THE  
BREGUET 940 'BLOWER-WING' PLANE),  
AD-652 998

• • •  
AGARD-408A  
RECOMMENDATIONS FOR V/STOL  
HANDLING QUALITIES WITH AN ADDENDUM  
CONTAINING COMMENTS ON THE  
RECOMMENDATIONS.  
AD-661 748

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AGARD-414  
AERODYNAMIC ASPECTS OF BOUNDARY  
LAYER CONTROL FOR HIGH LIFT AT LOW  
SPEEDS,  
AD-426 277

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AGARD-OGRAFH-46  
PARAMETRIC INVESTIGATION OF  
STOL AIRCRAFT,  
AD-687 167

•ADVISORY GROUP FOR AEROSPACE RESEARCH  
AND DEVELOPMENT PARIS (FRANCE)

• • •  
AGARD-577  
V/STOL HANDLING. I. CRITERIA  
AND DISCUSSION.  
AD-715 552

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AGARD-LS-42-71  
ASSESSMENT OF LIFT AUGMENTATION  
DEVICES.  
AD-720 259

• • •  
AGARDOGRAPH-126  
THE AERODYNAMICS OF V/STOL  
AIRCRAFT,  
AD-688 921

•AEROPHYSICS CO WASHINGTON D C

• • •  
REVIEW AND PRELIMINARY  
EVALUATION OF LIFTING HORIZONTAL-  
AXIS ROTATING-WING AERONAUTICAL  
SYSTEMS (HARWAS).  
(USAAVLABS-TR-69-13)  
AD-657 462

•AEROSPACE RESEARCH LABS WRIGHT-  
PATTERSON AFB OHIO

• • •  
ARL-69-0182  
THRUST AUGMENTATION  
CONSIDERATIONS FOR STOL AND  
EXTENDED CRUISE PROPULSION.  
AD-701 728

• • •  
ARL-71-0140  
WHY EJECTORS FOR AIRCRAFT  
PROPULSION-LIFT SYSTEMS AND WHERE  
WE STAND.  
AD-722 842

•AIR FORCE AERO PROPULSION LAB WRIGHT-  
PATTERSON AFB OHIO

• • •  
AFAPL-TR-66-90  
AN ANALYTICAL METHOD OF  
DETERMINING GENERAL DOWNWASH FLOW  
FIELD PARAMETERS FOR V/STOL  
AIRCRAFT.  
AD-809 185

0-1  
UNCLASSIFIED

AIR-AIR

• • •  
 AFAPL-TR-70-80  
 PERFORMANCE AND ACOUSTIC  
 TESTING OF A VARIABLE CAMBER  
 PROPELLER.  
 AD-724 145

• AIR FORCE FLIGHT DYNAMICS LAB WRIGHT-  
 PATTERSON AFB OHIO

• • •  
 AFFDL-TR-64-44  
 STRUCTURAL DYNAMIC RESPONSE OF  
 LARGE LOGISTIC V/STOL VEHICLES.  
 AD-601 051

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 AFFDL-TR-64-146  
 PRELIMINARY DESIGN  
 CONSIDERATIONS FOR A V/STOL WIND  
 TUNNEL.  
 AD-612 906

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 AFFDL-TR-72-01-FEM  
 STATIC AND DROP TESTS OF A  
 QUARTER SCALE MODEL OF THE CC-115  
 AIRCRAFT EQUIPPED WITH AN AIR  
 CUSHION LANDING SYSTEM.  
 AD-743 829

• • •  
 AFFDL-TR-65-73  
 AN ANALYTICAL STUDY OF V/STOL  
 HANDLING QUALITIES IN HOVER AND  
 TRANSITION.  
 AD-625 599

• • •  
 AFFDL-TR-66-114-VOL-1  
 DISPLAY AND CONTROL  
 REQUIREMENTS STUDY FOR A V/STOL  
 TACTICAL AIRCRAFT. VOLUME I.  
 ANALYSES.  
 AD-807 697

• • •  
 AFFDL-TR-66-114-VOL-2  
 DISPLAY AND CONTROL  
 REQUIREMENTS STUDY FOR A V/STOL  
 TACTICAL AIRCRAFT. VOLUME II.  
 APPENDIXES.  
 AD-807 698

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 AFFDL-TR-66-110  
 RESEARCH AND DEVELOPMENT OF A  
 CONTROL-DISPLAY SUBSYSTEM FOR A

TACTICAL V/STOL WEAPON SYSTEM.  
 AD-807 591

• • •  
 AFFDL-TR-67-119  
 DEVELOPMENT AND EXPERIMENTAL  
 EVALUATION OF A RETRIEVAL SYSTEM  
 FOR AIR FORCE CONTROL-DISPLAY  
 INFORMATION.  
 AD-663 756

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 AFFDL-TR-68-23  
 TAKE-OFF AND LANDING CRITICAL  
 ATMOSPHERIC TURBULENCE (TOLCAT)  
 ANALYTICAL INVESTIGATION.  
 AD-625 272

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 AFFDL-TR-70-88  
 BACKGROUND INFORMATION AND USER  
 GUIDE FOR MIL-F-87200-MILITARY  
 SPECIFICATION -- FLYING QUALITIES  
 OF PILOTED V/STOL AIRCRAFT.  
 AD-884 439

• • •  
 AFFDL-TR-71-23  
 THE GENERATION OF A MILITARY  
 SPECIFICATION FOR FLYING QUALITIES  
 OF PILOTED V/STOL AIRCRAFT-MIL-F-  
 87200.  
 AD-725 746

• • •  
 AFFDL-TR-71-26-VOL-1  
 STOL HIGH-LIFT DESIGN STUDY.  
 VOLUME I. STATE-OF-THE-ART REVIEW  
 OF STOL AERODYNAMIC TECHNOLOGY.  
 AD-724 135

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 AFFDL-TR-71-26-VOL-2  
 STOL HIGH-LIFT DESIGN STUDY.  
 VOLUME II. BIBLIOGRAPHY.  
 AD-724 186

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 AFFDL-TR-71-66  
 A JET FLAP DIFFUSER EJECTOR.  
 AD-726 596

• • •  
 AFFDL-TR-71-169  
 METHOD FOR THE PREDICTION OF  
 PERFORMANCE OF STOL HIGH LIFT  
 SYSTEMS NEAR MAXIMUM LIFT  
 COEFFICIENT.  
 AD-740 476

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AFFDL-TR-72-44  
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